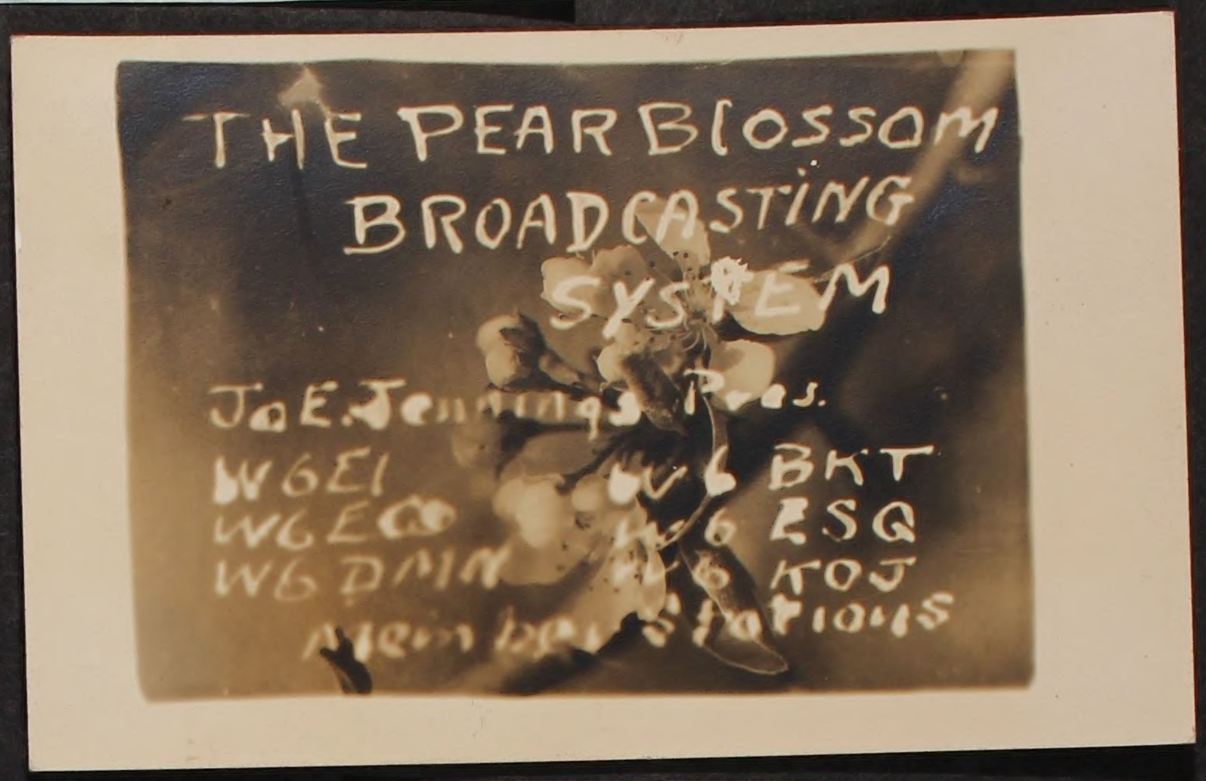
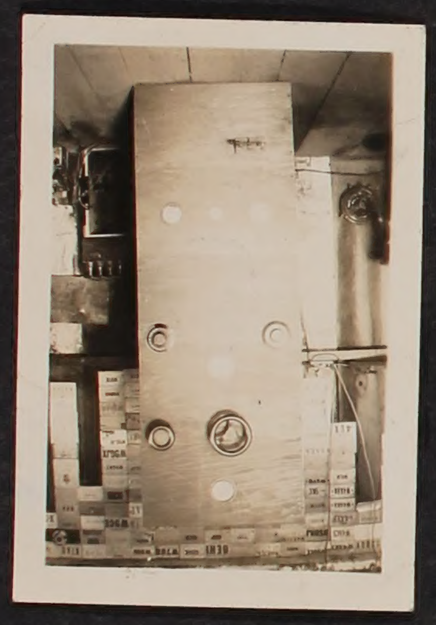
JENNINGS RADIO SERVICE



July, 1930
250 watt tube



1932 - 1933













1937

JENNINGS RADIO
The beginning



1941
The chicken house

WELCOME TO THE LAUNCHING OF

The

"S. S. Jennings"

V

Launching date . . . September 26, 1942

Launching time . . . 1 Bell (8:30 P.M.)

Port San Jose

Overall Length, 160 feet

Beam, 30 feet

Destination . . . Victory

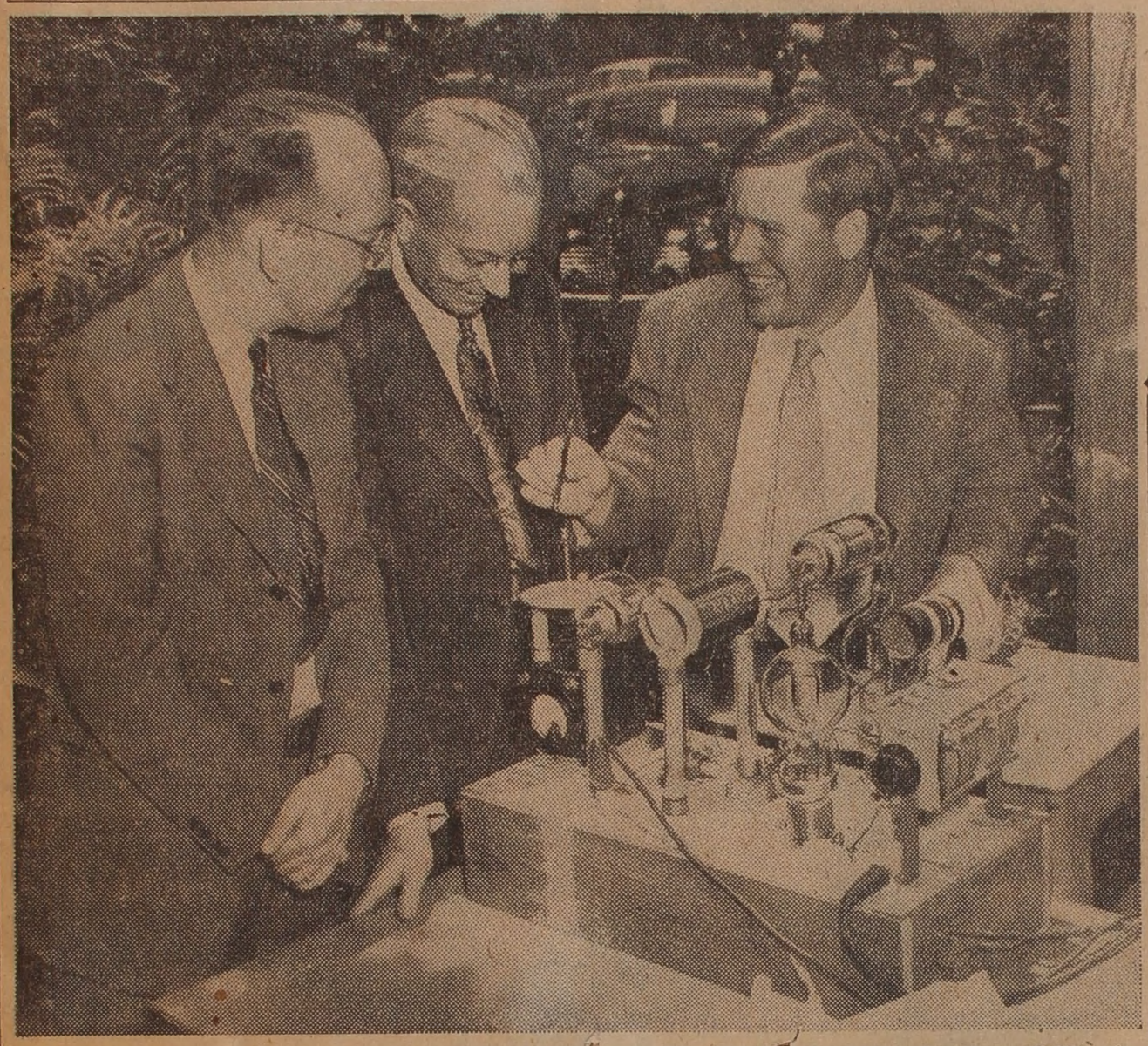
Missed Papers

Call Columbia 600 or contact your little merchant carrier if you miss your paper. He is anxious to correst any error in your service.

San Jose Mercury

June 15, 1945

Second Section — SAN JOSE, CALIFORNIA, FRIDAY MORNING, JUNE



RADIO — Northern California police radio communication men saw a demonstration of new high voltage, high frequency measurements at a dinner meeting at the Jennings Radio Manufacturing Co. here yesterday. Shown with the device, developed in Kentucky and the only one in use in the West, are Prof. Harry Engwicht, San Jose State College, left; Sgt. Henri Kirby, San Jose Police Department, center, and Jo Emmett Jennings.

Police View Latest Radio Gadgets Here

Jennings Radio Mfg. Co. Host to Northern California Officers

Approximately 50 members of the Northern California Police Communications Officers Association saw demonstrations of new high frequency and high voltage devices and heard a series of talks on modern police radio devices at a meeting at the Jennings Radio Manufacturing Co. plant here yesterday.

Speakers

Speakers included Prof. Harry Engwicht of San Jose State College radio school; Jo Emmett Jennings and Calvin Townsend of the host company; San Jose Chief William C. Brown and Sgt. Henri Kirby, San Jose police radio technician. Brown and Kirby, radio pioneers, discussed the strides made in police communications work through new devices and cooperation. Kirby served as meeting sponsor and was toastmaster at a dinner opening the affair.

Presiding was association president Harry Bogardus, San Francisco.

Committee

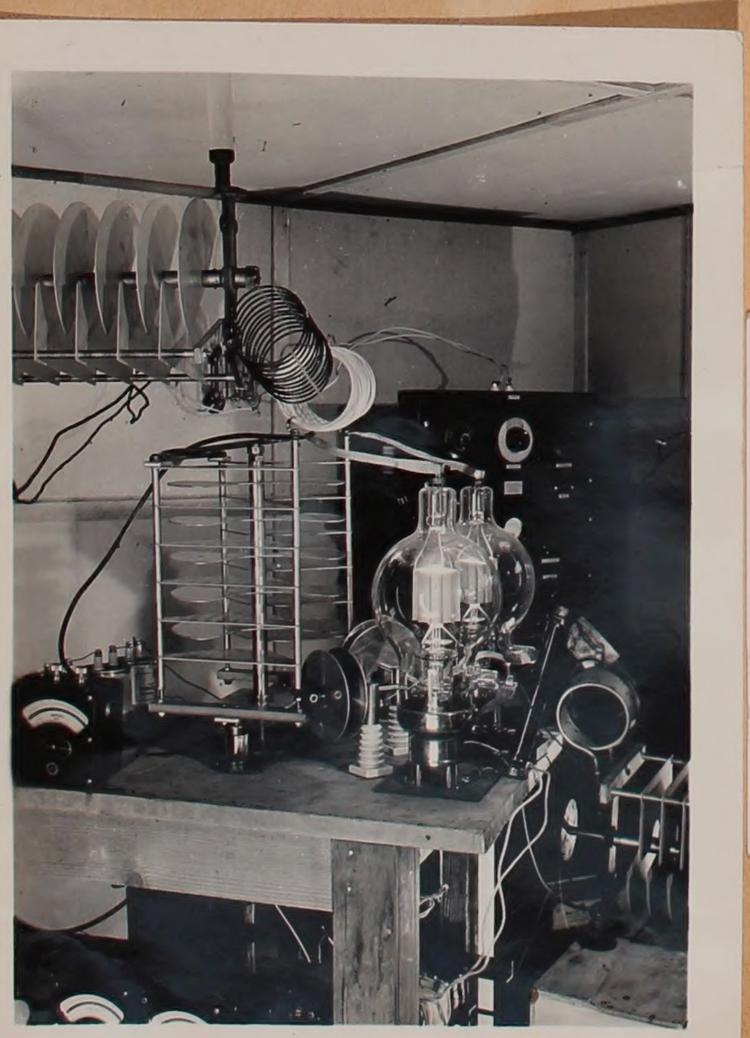
Named on a committee to work on a proposed new universal radio code for Northern California police agencies were Brower McMurphy, Jim McKinney and J. D. Taggart, all of Alameda County.

Sacramento was selected as the July meeting place, on invitation of Highway Patrol Sergeant E. J. McKee of that City.



Jo Jennings

Jo Emmett Jennings is a vacuum condenser tycoon and hires such stalwart hams as Lou Steward and Don Bellis.







Local Radio "Hams" Made Big Contribution to Winning of War

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Original Ideas Developed Into Electronic Achievements

By DICK BARRETT, WGCFK

There were the dark hours of the early morning when they sat with eyes closed and earphones tightly clamped down, concentrating on those faint whispers of code from across the seas . . .

There were those evenings at the microphone when they chewed the rag for hours on end with the W1s and W2s of the Atlantic Coast or the W9s in the corn belt . . .

And there were the afternoons when they shot the breeze with the gang down in Honolulu and Kukuihaele and Waialua and Wahiawa and Schofield Barracks . . .

But the war came and the happy days of the radio "hams" were over. The day the Japs bombed Pearl Harbor they pulled the big switch for the duration. Over night the ones with the technical "know how" discovered they were industrial tycoons. It was an electronic war and electronics was their hobby. Now it was their business—a multi-million dollar business.

"Dynamite Joe"

Take Joe Jennings for instance. Joe operated amateur station W6EI at the family home on McLaughlin Avenue. "Dynamite Joe" was what some of his pals used to call him because he was always fooling around with high power. But Joe had some original ideas about electronic equipment. The results were government contracts, a new industry for Santa Clara County and the factory which now stands in the Jennings prune orchard.

Then there was Garret Lewis of Los Gatos, W6EX, a husky, booming voiced engineer who loves his work so much he sometimes forgets to shave. His first war work was repairing vacuum tubes for British India. But Capt. A. E. Gifford, regional labor officer of the Signal Corps, persuaded Garret to remove his manly beard, go to the bank and borrow $100,000. Garret soon had seven small plants in and around Los Gatos turning out $149,000 worth of work a month at the peak. When contract cancellations arrived recently Lewis Electronics had done a $2,000,000 business manufacturing tubes under license with Radio Corporation of America and on some of Garret's own developments.

Elmer Hangs a Wreath

Lewis is a close friend of Mr. and Mrs. Elmer Armond, proprietors of a lighting fixture studio on the Bayshore Highway near Santa Clara where Armond operated amateur station W6LXA. After Pearl Harbor Elmer hung a wreath on his transmitter and went to work for Food Machinery Corporation installing radio equipment in amphibian tanks. Mrs. Armond (her handle is Grace) took a job in the tool room. This went on for awhile with Garrett coming around at intervals urging the Armonds to take a sub-contract making grids and plates for his vacuum tubes.



G. Armond



$50,000,000 WAR BUSINESS—Bill Eitel (right), a former Los Gatos radio ham, and his partner, Jack McCullough, ran a $5000 investment into a $1,500,000 plant and a $50,000,000 war business in the manufacture of vacuum tubes for transmitters and radar equipment at San Bruno and Salt Lake City. They are among thousands of amateur radio operators whose technical knowledge proved a valuable asset to their country when it went to war.

He maintained the two of them could handle the work easily in the shop adjoining their home.

The Armonds went to work. Soon they found the job getting bigger and bigger. They put their daughter-in-law to work. Eventually the crew totalled 15 divided into two shifts. It was delicate work, especially making the grids, but the final production total ran into a quarter million grids and an equal number of plates. When the contract expired Elmer turned back to making builders' hardware and lighting fixtures. He expects to take the wreath off his ham transmitter any day now.



E. Armond

Garrett also drafted another old-time ham and former KQW operator, Dan Williams, to assist him. Dan and a crew of six went to work in Dan's back yard at 1335 Magnolia Ave. They did all the tool and die work necessary for Lewis Electronics.

Hamfest At San Bruno

If you want to attend a veritable Santa Clara County hamfest, though, you'll have to take a run up the peninsula to San Bruno and visit the white stucco plant that bears the name of Eimac. Eimac is coined from the names of Bill Eitel, a native San Jose ham, and Jack McCullough, who did his early brass pounding in San Francisco. They started with a $5000 investment and have a $1,500,000 plant that did $50,000,000 worth of war business.

Bill's interest in radio goes back to his boyhood when he was picking up quartz crystals in Sierra streams, cutting and grinding them with his own equipment and using them in the radio apparatus with which he made the first trans-Atlantic and trans-Pacific contacts on 10 meters. That was in Los Gatos where his parents, Mr. and Mrs. W. Eitel, still live at 52 Alpine Ave.

Bill's First Job

After he had finished high school and served a term as president of the Santa Clara County Amateur Radio Association Bill landed his first job with Heintz & Kaufman at San Carlos. H. & K. was connected with Globe Wireless, which wanted to start business in competition with RCA but couldn't buy tubes because RCA owned the patents. It was up to H. & K. to produce them. The Heintz of the partnership was Ralph Heintz, the engineering genius who later attained fame in the Jack-Heintz Company of Cleveland.

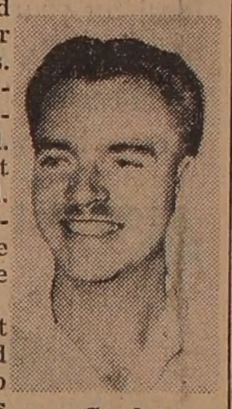
Bill met Jack McCullough there and they worked on design problems. Finally they decided to go into transmitter tube production for themselves. Bradford Harrison, a San Bruno real estate man, and Walter G. Preddy, San Francisco theater owner, chipped in $2500 each. It was agreed that Harrison and Preddy would share first profits equally until they had each received $1250. They got their money during the first year.

That was in the early 1930s. In 1941 Preddy sold his interest to the three other stockholders for $57,000. Eitel became president, McCullough vice-president and treasurer and Harrison secretary.

First Big Break.

The plant was started in a San Bruno meat market. It went along in steady but unspectacular fashion until it received its first big break in 1940—a contract with Western Electric for 10,000 tubes for military equipment. The crew increased tenfold in a year.

Early in the war the firm built one of the first radar sets in the country at a cost of $8000. The Navy took it to Washington and copied a number of features. Eimac didn't patent it, but General Electric did. Eimac got what it wanted, though—the contracts to make tubes for the equipment.



Gorden

As the plant grew Bill and Jack turned to their ham friends for help. One of the first to join up was Ronnie Gordon, son of J. C. Gordon, the commercial photographer. Ronnie had been operating his own ham station since he was 15. He did a lot of the early development work and perfected many glass techniques.

Gordon Howes, W6CEO, son of Realtor Charles Howes of this city, went into radio right out of high school. He joined Eimac in 1935 as a glass lathe operator and became plant superintendent at San Bruno until he was sent to Salt Lake City to lay out a new and larger plant there. When the need arose for a pilot plant to make tungsten to protect the firm from a threatened shortage Gordon chose a staff, supervised construction of the plant and it was soon turning out Eimac's own tungsten. He now rates the title of chief engineer.



Howes

In 1937 O. P. Taylor, who had earned fame at Sunnyvale by talking to the whole world from W6BAX joined the pump department. He had hooked up with hams in 140 countries before the war changed all that. He has been head of the pump department since 1938.



Taylor

Back in the 1930s George Wunderlich W6DUW, had a shop here in which he built radio apparatus. He moved up the peninsula, wound up at Eimac as general manager of both the San Bruno and Salt Lake plants.

O. H. (Hank) Brown, W6HB, a

SAN JOSE MERCURY HERALD AND NEWS



Brown



Sanderson

former San Josean, was an operator at KPO, then conducted a manufacturing business of his own for a time. He is head of Eimac's sales department.

Earl (Sandy) Sanderson W6IUZ, as proprietor of the Superior Laundry Service, took his customer's washing to the Saratoga Laundry operated by one Mr. K. Hatekayama in pre-war days. As he drove about the valley in his panel delivery truck Sandy dreamed of transmitters, receivers and antennas. A day or two after Pearl Harbor Mr. Hatekayama disappeared under FBI auspices and Sandy turned to radio for a living. He is Eimac's purchasing agent.

Willard Tallmon, W6DVB, a Morgan Hill native, found radio more attractive than ranch life or the practice of forestry, in which he received his Bachelor of Science degree at the University of California after three years at San Jose State College. He became head of Eimac's inspection department. He is the son of Mr. and Mrs. George A. Tallmon of Morgan Hill.



Tallmon

There are a lot of other hams from the Bay Area on the Eimac payroll, of course, but these are the best known in Santa Clara County.

Built New Industry

And so the hams have built a new electronic industry in our midst. It's an industry that faces a shrinkage in peacetime, but has no reconversion problem in the usual sense. Its products will have a larger demand than in pre-war days. Eimac, for example, expects to retain a crew that will be five or six times as large as it had before Pearl Harbor.

In any case, most of the hams have considered it a grand experience. Now they await the day when they can light the filaments once more in their transmitters and resume the long rag chew.

Santa Clara County Ham Makes First 6-Meter Hawaii Contact

By W6CFK

Patience had its reward for Roy Pinkham, W6BPT, of Santa Clara, when he became the first local radio amateur to span the Pacific to Hawaii with six-meter signals.

Pinkham, who has dreamed about a v.h.f. contact with Hawaii since 5-meter days had his big moment on Sunday afternoon, Oct. 12. He was tuning at the low end of the band when he picked up a carrier which was then detectable only with the beat-frequency oscillator.

As he listened the signal gradually built up. It is a fair guess that his hair stood on end when he heard the operator sign himself as W7ACS/KH6 at Pearl Harbor. Pinkham immediately called a brother ham, Jim Brannin, W60VK of Redwood City. Brannin was engaged in planting a new lawn, but he dropped everything and switched on the filaments.

The two hams listened breathlessly while the station talked to a half dozen operators in the Los Angeles area. Then Brannin established contact and told the Pearl Harbor operator to listen for Pinkham. The Pearl Harbor man expressed amazement at the strength of the Santa Claran's signals.

"That was a bigger thrill than I ever had working much greater distances on 10 and 20 meters," Pinkham said later.

To the suggestion that he might next make a KH6 contact on two meters, Pinkham replied, "I'd drop dead if that happened."

Which proves that ham radio offers hazards other than high voltage.

* * *

Speaking of high voltage, Joe Jennings, W6EI, made a strong case for super e.m.f. in an address before the Santa Clara County Amateur Radio Association. Using an oscillator and a light bulb for a dummy load, Jennings demonstrated the higher efficiency to be obtained with high voltage and low current as against lower voltage and higher current.

Nicknamed "Dynamite Joe" in his younger days, Jennings has always been a believer in high voltage. Now he is proving his point.

* * *

The SCCARA face a dilemma.

By-laws require that the organization nominate officers at its second meeting in October. That meeting, under the by-laws, falls on Oct. 27. On the same evening A. L. Budlong, assistant secretary of the American Radio Relay League, will be in San Francisco for a "ham" meeting several of the local members would like to attend.

The question of whether to change the local meeting night—if that's legal for a corporation—has been referred to the executive board for a decision.

Appropos of Roy Pinkham's contact with the Hawaiian Islands on six meters, related above, a bulletin has come from ARRL headquarters stating that new 50 mc. DX is bebing reported almost daily.

ZS1P, Capetown, South Africa, worked G5BY, cross-band on 28 mc. on Oct. 3. A two-way contact with PAUN was made by ZS1T and ZS1P on Oct. 11, a new 50 mc. DX record of 6000 miles.

Commenting on the high maximum usable frequency between the western United States and the Pacific Islands, the League reports that W6UXN had a partial contact with J9AAO on Oct. 7 at 7 p.m. PST.

It is expected that transatlantic contacts will be made on 56 mc. during November and that transcontinental contacts should also be possible.

* * *

Cecil Woods, W6JSF, is taking the initiative to reorganize the Palo Alto Amateur Radio Club. First meeting will be held at 7:30 Monday evening at the Palo Alto Community Center. Jeff Almy, W6TBK, will preside. Woods hopes that a delegation of SCCARA members will attend.

Saturday, November 10, 1945

Radio Tube Firms Here Have 'Corner' West of Chicago

Five plants in Santa Clara County and on the San Francisco Peninsula have what amounts to a "corner" on the manufacture of radio tubes west of Chicago, it was indicated yesterday by Jo E. Jennings of the Jennings Radio Manufacturing Co. in a talk before the San Jose Chamber of Commerce Friday Luncheon Club.

His own plant here, which had a peak of a few more than a hundred workers on the assembly line alone during the war, making high priority tubes for the military services, continues to have 60 to 70 on the line turning out multiple models from raw materials.

Included in the different types of condensers and transformers are several incorporating new ideas and techniques not duplicated elsewhere, Jennings said, adding that his plant has gone in for "modern design."

Speaking on radar, he said peacetime applications include aids to navigation, which recently enabled a cruiser to proceed full speed in fog through straits allowing only a 5-foot clearance; a new device for the blind, employing a series of light flashes to help them get around without running into objects, and induction heating.

Experimentally, he said, potatoes can be cooked from the inside out in half a minute, a 5-pound roast in 5 minutes. The problem now is to perfect one piece of equipment that will cook all types of foods instead of requiring a different piece for each type, as at present.

William C. O'Rielly was chairman of the luncheon meeting.

The Weather

"I made a call on my old pal, Joe Jennings, the electronics tycoon, yesterday," Joe Weatherman said to the missus. "You should see the factory that Joe has built out in the middle of a McLaughlin Ave. prune orchard."

"That's a wonderful idea," said Mrs. W. "I think every grower should have a factory in his orchard. Then when the price of prunes is down he can get rich on something else."

"Joe is one of the power company's best customers," the Peerless Prognosticator added. "He has volts and amperes running all over the place. You open a door and they practically jump out at you."

"In other words, in addition to prunes he has currents," Mrs. W. said brightly.

"You kill me," said her husband. **"Clear today and tonight, Sunday partly cloudy, little temperature change."**

The highest temperature yesterday was 57, the lowest this morning 30. Rainfall: seasonal total, 4.16 inches; normal, 6.44 inches; this date last year, 7.15 inches.

SAN JOSE MERCURY HERALD

War Plant Story Is Re-Told

The morning-after-the-war-ended cutbacks held no worries for Joshua Hendy Iron Works employes—they merely returned to their Santa Clara Valley farms—former Hendy President Charles E. Moore says in this week's issue of the Saturday Evening Post.

One of the war's unexpected compensations is the increased skill of people living in rural areas, according to Moore.

"The war sent millions of people to be upgraded to better skills," he says in the Post article. "We have increased our national wealth in proportion to the increase in our know-how. We don't have to worry about competition from other nations with low standards of living. If we are smart enough to capitalize on what our people have learned during this war, this country can out-produce any other nation."

The Post article, written by Frank J. Taylor of Los Altos, says that the record made by Hendy and other plants throughout the country is directing the tide of industry toward rural areas. "The Santa Clara Valley is a good example of why," says Taylor.

The article says that when war orders flooded Hendy "the employment office never beat the drums for help, never imported trainloads of workers," because "the countryside seemed to be an inexhaustable reservoir of workers," that "when the whistle blew Hendy employes were only a few minutes from their homes on surrounding farms or in nearby small towns."

Hendy employes don't worry about layoffs, because most of them can make a good living off the land, Taylor says.

"Johnny Marovich kept 12 acres of prunes, apricots and walnuts in production," he continues. "Dried fruits and nuts were high priority war stuffs, too. So Marovich, like Yardmaster Paul Arnerich with 10 acres of prunes at Los Gatos, Machinist Johnny Blue with 15 acres at Sunnyvale, Frank Snyder, who ran a Hendy planer by day and grew 'cots after hours, Crane Operator Ray Garner and Tom Myers, the steel-saw man, as well as several score of other Hendy workers, doubled in iron and foodstuffs."

The Post article refers to Food Machinery Corp. as "another industrial giant that grew up in the valley" with its production of Water Buffaloes for amphibious landings, reporting that the plant has swung back to food processing machinery and orchard equipment.

"Typical of the valley's surprising electronics manufacturing industries is the Jennings Radio Co., just outside the San Jose City limits," writes Taylor. "Jennings turned out $500,000 worth of electronic products last year. Joe Jennings and his partner, Calvin K. Townsend, thought highly enough

Wednesday, April 10, 1946

of their peacetime outlook for business to turn down some good offers from big competitors who wanted to buy them out."

Wednesday, Nov. 13, 1946

San Jose Evening News
Wednesday, Nov. 13, 1946

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SAN JOSE, CALIFORNIA, WED

CONDENSER IS INVENTED BY S.J. MAN

By JEANNETTE BEFAME

Jo Jennings, co-partner in Jennings Radio Manufacturing Co., has invented a new vacuum variable condenser for use in long and short wave broadcasting and for induction and dielectric heating.

Advantage of the vacuum variable condenser is to adjust the capacity of the condenser—that is to adjust the internal parts externally.

The adjustment is made by use of a bellows, which enables maintenance of a vacuum internally. By mechanical means of a shaft one is able to change the relative parts without destroying the vacuum.

The physical volume of a vacuum variable condenser is approximately one-tenth as large as a standard air condenser.

SIZES VARY

Jennings' new variable condenser models range in size from five inches to 16 inches long and from 1½ inches to six inches in diameter.

Voltage ratings range from 17,000 to 35,000 volts. The capacity ranges are from two to 500 micro-micro-farads.

Capacity of a non-adjustable vacuum condenser ranges from one to 1000 micro-micro-farads. Voltage usually is from 10,000 to 50,000 volts.

The vacuum variable condenser structure contains five metals—copper, nickel, silver, tungsten and tin.

FIVE STEPS

As explained by Jennings, operations in the manufacture of a vacuum variable condenser are these:

1. Joining of the copper parts to the glass bulb.
2. Installation of the bellows assembly.
3. Sealing of the fixed end to the glass bulb.
4. Sealing of the fixed bulb to the variable end bulb by means of a center glass seal.
5. Evacuation of the finished units with a special high vacuum pump system.

Jennings said development of an adequate variable unit has baffled the electronics industry for more than 25 years.

It was four years ago that he conceived an idea for a vacuum variable condenser. With a crew of 20 of his employes he began his studies. A few months ago the finished product was completed. It is now being marketed throughout the world. Approximately 2500 hand-made models have been distributed.



Jo Emmette Jennings, co-partner in Jennings Radio Manufacturing Co., 1098 E. William St., displays two vacuum variable condensers—the largest and the smallest—which he invented for use in radio broadcasting for long and short wave, induction heating units and dielectric heating. Pictured in the background is Mrs. Sara Ann Pye working at a glass lathe.—San Jose News photo.

Jennings Shifting To Manufacture Of Civilian Goods

Jennings Radio Manufacturing Co., producing vacuum electronic components, an unique San Jose industry, offers an example of minimum problems of reconversion, Calvin K. Townsend, partner of J. E. Jennings, said last night.

Although this firm has been listed among those cutting back in employment because of a probable drop from 85 to 75 employes, it's full speed ahead, he said, on production for civilian use of the same components which have been turned out for war use at a phenomenal rate.

Many orders received since Tuesday's victory announcement, according to Townsend, have been for delivery by air to big eastern firms in the United States and Central and South America, for 90 percent of the world output of these particular components is from San Jose.

Peace-Time Uses Cited

Peace-time uses of vacuum capacitators are in police and airplane radios, diathermic and other medical equipment, electronic heating, and also for special controls in airplanes such as altimeters, rate of climb indicators, and special actuating equipment for automatically turning on pressurized cabins in high altitude flights.

Commercial development of these vacuum components, which weigh about one pound instead of the 24 pounds of old style units, has been pioneered by this San Jose firm, featured recently in one of the San Jose Chamber of Commerce ads in Fortune. In the past few weeks seven national electrical equipment magazines have devoted editorial comments to the Jennings Co. and descriptions of its products.

Working on Rocket Bombs

Jennings, who has displayed a serious interest in radio since the age of 7 and who, as a ham operator in his 'teens, did testing for some of the Stanford University scientists, now has three veterans among his seven laboratory associates. They are still working for the Navy on dive-control for rocket bombing, Townsend revealed.

An instrument originally worked out for measuring temperatures and pressures in oil wells was converted to use in airplane altimeters during the war and hereafter in peace. And now again its use in oil wells will be developed. Components used in radar also now have new industrial applications.

Aside from recently repainting the plant at McLaughlin Ave. and Story Road, and installing some new machinery and laboratory equipment, conversion to peace production, Townsend said, consists only of changing the bookkeeping to take care of civilian instead of military orders.

THE SATURDAY EVENING

POST

APRIL 13, 1946 10¢

THE FUTURE OF ATOMIC ENERGY

By WILLIAM L. LAURENCE

DEMAREE BESS Reports on France



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THIS WEEK'S COVER



NOT long ago, Constantin Alajalov, who painted our cover for this week, had an experience that preyed on his mind until he decided to exorcise it by changing it into a Post cover. One evening a friend—he was a friend *then*, at least—suggested that a theater party, of which Alajalov was a member, would do well to dine lightly, in order not to be late for the curtain. "Afterward I'll whip up a little something for you," the suggester said. "It didn't work out quite that way," Alajalov said bitterly. "He had trouble doing a thing called 'separating' eggs, whatever that is. We thought up a few names for the concoction he produced, but we decided it would be kinder not to use them." When Alajalov got around to painting his shattering experience, Mrs. Brian Aherne, the wife of the movie star, lent him her pin-up kitchen as a model—flowers in the window, built-in cabinets, pet cookbook and all.

The names of characters used in all Post fiction and semi-fiction articles that deal with types are fictitious. Use of a name which is the same as that of any living person is accidental.

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Factory in the Country

What industry learned during the war may make it possible for many to realize the dream of combining a job and the independence of rural life.

By FRANK J. TAYLOR

AFTER several weeks of inspecting sites, studying acres of pie charts and statistics and listening to Chamber-of-Commerce spokesmen exuberantly selling climate, housing, labor and transportation of their respective neighborhoods, a cold-eyed committee of International Business Machines Corporation executives suddenly settled for a building on the outskirts of San Jose, California, for a new branch plant. With the deal in the bag, Russ Pettit, secretary of the local chamber, asked the IBM men if they would mind explaining what was the deciding factor in their choice.

"Sure, we'll tell you," replied one of them. "We looked around the valley and saw a rosebush in every yard."

In the past two years, twenty-eight other companies have selected Santa Clara County, for which San Jose is the seat and business mecca, for new plants. Not all of them went around scanning for a rosebush in every yard, but all were looking for what the rosebush in every yard stands for—a chance to decentralize production in a rural atmosphere where workers own their homes or live on farms in the surrounding countryside.

The war accelerated the tide of industry toward the country by giving country plants a chance to prove what they could do in competition with factories located in cities. Country war industries generally had less trouble finding workers, less absenteeism and fewer labor squabbles. Country locals of unions were more co-operative. Rural workers generated more enthusiasm for getting the job done. What the countryside factories accomplished adds up to a significant chapter in the war record of United States industry. It explains why industrial big names like General Motors, General Electric and others in the East are investing in sizable plants in smaller cities or right out in farm areas.

The Santa Clara Valley is a good example of this industrial evolution, because it is typical of a lot of other areas all over the country that now have thriving industries scattered over their rural landscapes. The valley today is an industrial beehive, with large and small plants sandwiched among the prune, apricot and pear orchards, among vegetable farms and in the outskirts of towns. These plants which boomed on war orders swung over to peacetime products after V-J Day.

Prior to the war the valley, about half the size of Rhode Island and surrounded by mountains, except for San Francisco Bay on the north, was almost entirely agricultural. Its people made a good livelihood by growing one third of the world's dried prunes, half the dried apricots, plus pears, walnuts, cherries, tomatoes and other farm products for canning, dehydrating or freezing. The only exception was San Jose, where several small plants—industrial offshoots of agriculture—made pumps, orchard-spray outfits and cannery equipment; and sleepy Sunnyvale, where the little red Joshua Hendy Iron Works manufactured heavy machinery for dredging, irrigation dams and aqueducts, and mining equipment.

This little old ironworks, dating from gold-rush days, unexpectedly paced the industrial tidal wave that swept the valley. Bad days had overtaken Hendy by 1940 and, in November of that year, Charles E. Moore, a go-getting San Francisco machinery salesman, spearheading a group of Western construction men including Felix Kahn, Bechtel Brothers, Henry Kaiser and others, bought it from the bank that had foreclosed in payment of a debt. Moore wanted the plant's tools for some of his big customers who were expanding to fill defense orders.



JACK MANNING

The double life pays off here. When the employees of this engine plant in Sunnyvale, California, are not working in the shop, they are harvesting prunes, apricots or pears on their adjoining farms.

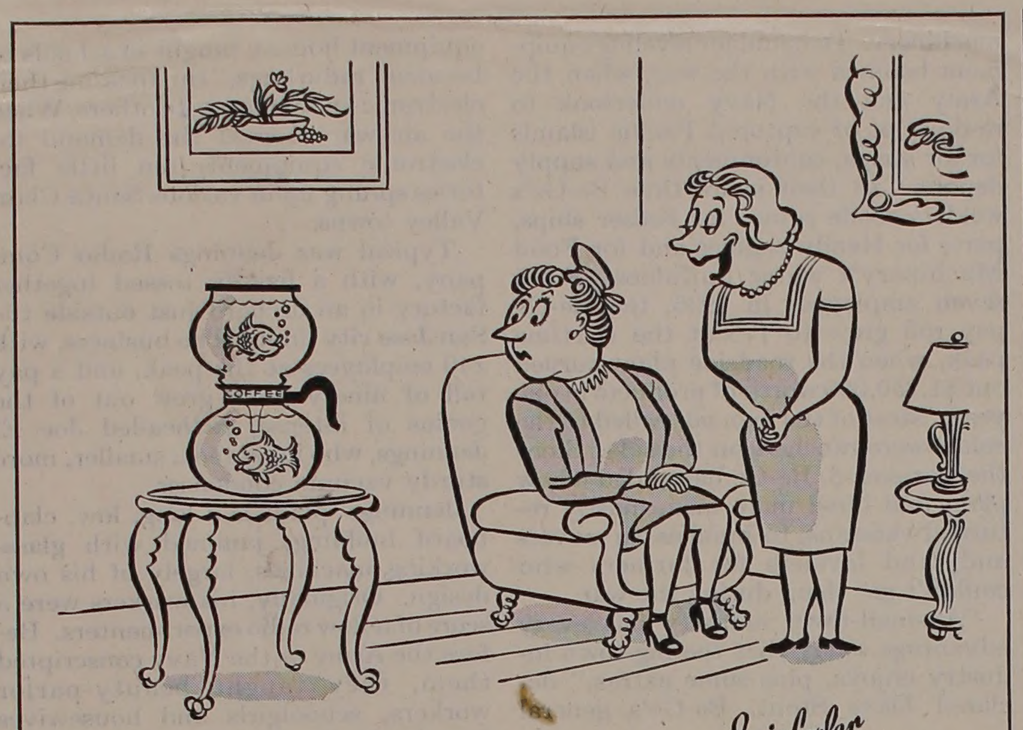
The Bonanza in the Bean Field

WHEN he took over his purchase—a gray mission style office and engineering building, with the factory and machine shop in back, the whole plant sandwiched between a bean field and a pear orchard—he found that he had fifty-three employees, all country folk from neighboring villages and farms, with a lot of mechanical experience. The foreman remarked that Hendy had just passed up a sizable potential Navy job on the ground that it was precision work and too much of a headache to handle. Moore, who is an old machine-tool operator with a small boy's yen for making machinery do complicated jobs, said, "We're going after it."

In Washington a $10,000,000 contract for torpedo tubes, plus $1,300,000 for plant expansion, was shoved into his hands by the Navy. The immediate problem was where to find skilled mechanics to operate the precision tools that the Navy promised to provide for the new plant taking shape in the bean field and orchard, from which Hendy had collected $1100 for farm produce the year before.

Before Moore could begin beating the streets of the near-by cities for mechanics, this labor problem solved itself almost miraculously. Word grapevined around the valley that Hendy needed men for an important Navy job. Every morning more men appeared at the gates, offering to go to work. Many of them were skilled mechanics who had retired to small farms and orchards. Others were farmers or orchardists who were likewise Handy Andys at repairing tractors, pumps, spray rigs and other farm equipment. By the time the new machines were in place, Hendy had plenty of men to run them.

Then another unexpected order brought what looked like a crucial labor crisis. Back in World War I, the Hendy plant had built one dozen clumsy, heavy, three-story-high Liberty engines for freighters. Frantically seeking to span the Atlantic with a "bridge of ships" to keep England in the war, Admiral Emory S. Land, then head of the Maritime Commission, *(Continued on*



"They hated living together."

FACTORY IN THE COUNTRY

(Continued from Page 20)

put Hendy down for a dozen more engines, allowing the little ironworks two years to build them. That was easy, but a short time later the admiral asked Hendy to double the order. Impetuous Charlie Moore said it would be just as practical to tool up for 100 engines. Over the long-distance phone Hendy's quota became 112. Eventually, the country Jakes and Janes at Hendy pushed 754 Liberties out of the plant's doors, 100 smaller Vickers jobs for Navy frigates, seventy large steam turbines to power freighters and transports, and 800 smaller turbines to furnish electric power aboard ships.

Under this inundation of orders, the pay roll jumped from 53 to 8000. Yet the plant's employment office never had beat the drums for help, and had never imported trainloads of workers as did the near-by shipyards which took the engines it built. The countryside seemed to be an untapped reservoir of workers, both men and women. There were no rows of war housing outside the plant. Hendy had none of the housing, feeding, transportation and recreation headaches that plagued war industries in metropolitan areas, because the Iron Men and Women of Hendy, as the employees called themselves, had these problems already solved. When the whistle blew, they were only a few minutes from their homes on surrounding farms or in near-by small towns.

The mayor of the town of Sunnyvale worked a night shift, as did several school principals and a score of teachers. So did some of the small-town business and professional men. There were schoolgirls, schoolboys and housewives who formerly had worked a few weeks every summer in canneries. Hendy was known as "the most jigged and fixtured engine works in the country," with a pattern for every job. Thus the know-how of a few skilled mechanics enabled these country folk to build complicated engines. Over the works eventually flew the Maritime Commission's M flag with six stars and the Army-Navy E flag with four stars.

"We never could have run up a record like Hendy's in a plant this size in a big city," insisted General Manager Harry Gunetti. "Out in the country our people lived better, their health was better, their enthusiasm and devotion to work was greater. In a big city, the very nature of a workman changes. He stands in line and is a cog in a machine. Down here in the country he owns his own home and is somebody."

Nobody at Hendy worried about the morning-after-the-war-ends cutbacks. When the 754th Liberty engine was delivered the pay roll shrank from 8000 to 5500. The layoff made hardly a ripple in the life of the community, because Hendy workers returned to their tractors and to their kitchens. Later, when the Navy dumped a hurry-up order for 16-inch shells into the plant, hundreds of them pulled on their jumpers and came back to work again.

Recently, Navy cancellations forced a temporary pay-roll cutback of 1400 workers. Before they were laid off, 200 workers quit voluntarily to go back to their peacetime occupations—running garages, farming, teaching. At the gate that day, recruiting booths were set up by seven large employers of the area. They were looking for mechanics, but bagged only two dozen or so. "No, I'm going fishing," and "I've got to work on the farm," were typical replies from the discharged Hendy workers, most of whom expect to be back on the Hendy pay roll soon, when materials are available to build peace products. Every former employee's name is on the call list.

The plant had a good backlog of orders for turbines and Diesels for Russia and China, and a production schedule for heavy machinery, as soon as materials were available.

"Heck, we don't have to worry about jobs," explained John Marovich, shop steward in Plant No. 1. "Any of us can make a good living off the land."

Johnny Marovich kept twelve acres of prunes, apricots and walnuts in production. Dried fruits and nuts were high-priority war stuffs too. So Marovich, like Yardmaster Paul Arnerich, with ten acres of prunes at Los Gatos, Machinist Johnny Blue, with fifteen acres at Sunnyvale, Frank Snyder, who ran a Hendy planer by day and grew 'cots after hours, Crane Operator Ray Garner, and Tom Myers, the steel-saw man, as well as several score of other Hendy workers, doubled in iron and foodstuffs. With the return to the forty-hour week, most of Hendy's men



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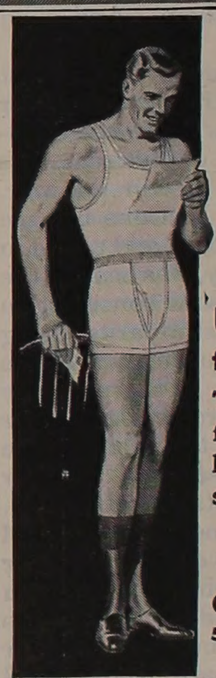
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Journeying Of Local Products Romantic Story

Valley's Products Travel Far

In Honolulu a young Hawaiian-American mother opens a small can of baby food and gives her infant a spoonful of vegetables, over which he gurgles happily. The label on the can shows that it was processed at the Clapp Baby Food plant in San Jose.

In a food processing establishment in Palestine a large and complicated piece of machinery hums busily and efficiently. On it is a plate showing it was manufactured in San Jose, California, U.S.A.

At an irrigation plant near Mexico City a workman turns a wheel and a butterfly valve opens. The gigantic valve was made at the Westinghouse plant in Sunnyvale.

At a company store near a diamond mine in South Africa a dusky native hands over some coins and the storekeeper gives him a round can of candy. The white and brown label indicates it was packed by O'Brien's in San Jose.

In a little village 50 miles from London a British housewife carefully and almost reverently opens a can of apricots. The luscious yellow contents once hung on a tree in Santa Clara Valley and were canned here.

In Brazil a woman pries open a box of dried fruit. Stencilled on the box are the words: "Rosenberg Bros., Santa Clara."

In New Zealand a farmer places a ladder beneath a tree as he resumes his job of pruning. Stamped on the side of the ladder are the words: "Larson Ladder Company, San Jose."

In Switzerland a scientist carefully makes an adjustment upon a delicate electronic device. The tubes which are the heart of the apparatus were made by the Jennings Radio Manufacturing Company here.

Bulldozer Is Far from Home

In Arabia a huge bulldozer bucks against a pile of dirt outlining the path of a new highway. The roaring, snorting machine is a long way from the Wooldridge plant in Sunnyvale, where it was born.

In China a girl opens a package of cards for an electrical accounting machine. These cards were manufactured at the plant of the International Business Machines Corporation, in San Jose.

In Argentina a laborer opens a box of Santa Clara Valley prunes and mixes them into container of Argentine prunes, in order to improve the quality of the product which the housewife buys.

A motorist pauses beside a road in Canada and consults a map which was manufactured by the Gousha Map Company out on The Alameda, here. In Bolivia a man adjusts a stereoscope which bears the mark: "Stanford X-Ray Stereoscope Company."

In Port Au Prince a waiter draws the cork from a bottle of Burgundy and pours the wine into the glasses of a man and girl. On the bottle is a label: "Cribari and Sons, San Jose."

The romance of the manner in which San Jose and Santa Clara products carry a message of honesty and goodness all over the world is interesting and amazing. Thousands of products, manufactured by hundreds of concerns and shipped to tens of thousands of cities and towns, advertise this city and valley. It is a striking demonstration not only of the variety of the products of this valley but of how the threads of trade tie the whole world together.

Exports Are in Great Variety

The products of this valley range from tiny Jennings radio tubes sent to South Africa, Switzerland, Sweden, Belgium, France, Australia, New Zealand and the South American countries, to the giant 11-foot water valves which Westinghouse is manufacturing for the State Commission of Irrigation of Mexico.

Food Machinery's products go to South Africa, Algeria, French Morocco, Tunisia, Argentina, Chile, Brazil, Venezuela, Colombia, Peru, Mexico, Cuba, Puerto Rico, Trinidad, Jamaica, Canada, England, Belgium, Holland, France, Norway, Sweden, Palestine, Russia, India, Australia, New Zealand, French West Africa and many other countries.

People can buy the candies of the O'Brien company in South and Central America, Panama, Mexico, Hawaii, the Philippines, Canada, Alaska and in many other places.

The California Prune and Apricot Growers Assn. exports between 25 and 30 per cent of its production to North Europe, Great Britain, Central and South America, New Zealand and South Africa.

International Business Machines ships the products of its local plant to Hawaii, China and the Philippines and expects to set up additional markets in the Far East. Wooldridge of Sunnyvale sends its dirt-moving machinery and other products to Russia, Saudi Arabia, South America, Mexico, England, Australia, the Dutch East Indies, etc.

Clapp's send their baby foods to Hawaii, South America, China, and to scores or hundreds of Army embarkation centers all over the world. The Cribari company now sends its wines to Hawaii, Mexico and Arabia and in normal times exports to Puerto Rico, the Philippines, Iceland, Mexico, Haiti and many other areas.

Needless to say the firms and products mentioned above are by no means the entire list. It would be an exceedingly difficult task to find out all the products of all our local concerns which are sent to foreign lands. There are, for instance, the canned fruits and vegetables and the dried fruits and nuts of our canning companies—Richmond-Chase, Barron-Grey, the California Packing Corporation and the others. There are the products of the International Minerals Corporation, soon to travel far and wide. There is the Be Ge Manufacturing Co. of Gilroy, with its extensive exports.

Trade Is World's Life Blood

Three things are worth noting about all this.

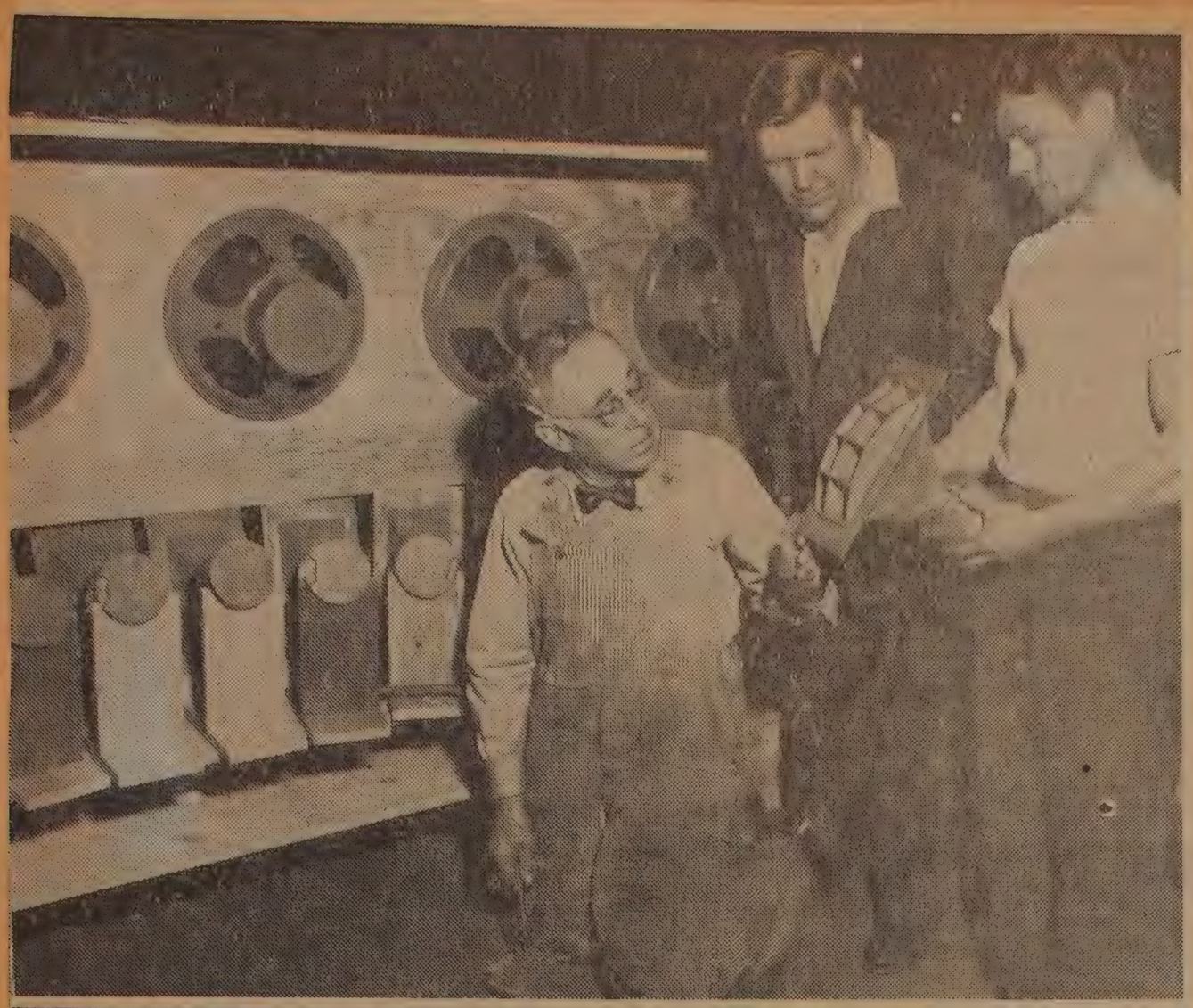
One is that all these products must be of fine quality. People do not pay their money to import poor quality goods across thousands of miles of land and water. That so many of our goods are shipped so far is proof of their honest quality.

Likewise apparent is the fact that trade is the economic life blood of the world. If a Santa Clara Valley product is sold to a firm in South Africa both America and Africa benefit from such exchange. The growth of international trade offers the greatest hope for a cure of the world's ills.

Finally, many of the firms interviewed stated that the great potential market of the future is the Orient. When China and the other Oriental nations get on their economic feet and as their standards of living starts to rise, they will absorb huge amounts of American goods. When that time comes the plants in San Jose and California will be most strategically located.



On this page is told the romantic story of how Santa Clara Valley products carry the name and fame of this region around the world. In the above photograph Frieda Heintz, head of the shipping department of Jennings Radio, checks a carton of tubes to be shipped to Charleroi, Belgium.





Here's a behind-the-scenes look at preliminary work on the new $6000 16-unit public address system being installed in the Civic Auditorium by Jennings Radio Manufacturing Co. of San Jose and the electricians of the San Jose Public Works Department. Above A. H. Rolison, master carpenter of the Public Works Department; Jo Emmett Jennings, of the Jennings Co., and Charles Cano, stage carpenter at the auditorium, look over units of the loud speaking system. Below, Frank Faull, auditorium electrician, examines the control and switch board which will be installed in a special soundproof control booth just off-stage. The new 16-unit system will replace the present public address units, found to be inadequate.—San Jose News photos.

Sound Equipment Will Be Vast Improvement

One of the best pieces of news to come from the San Jose Civic Auditorium recently is that an adequate sound system is to be installed and will be ready within a month.

It will be particularly gratifying to those who intend to enjoy the remaining programs of the San Jose Concert Series. There will be Patrice Munsel, coloratura soprano; the San Francisco Symphony Orchestra with Pierre Monteaux directing; the De Paur's Infantry Chorus, and Arthur Rubenstein.

The auditorium management says the sound equipment being installed is the best obtainable. We hope that is true, because for lack of it many have been denied full enjoyment of artists appearing there, and they are also the best obtainable.

There will come a day when San Jose will have its opera house and theater, better suited to music and drama than the all-purpose auditorium. Meanwhile the value of the Civic Auditorium will be greatly enhanced by such improvement as that now being made.

1948

Amateurs in the northern end of the County are reminded that Joe Jennings, W6EI, will address the PARA at 7:30 tomorrow evening in the Palo Alto High School on "Parasitics in Oscillators and Amplifiers." 6/6/48 - Nancy

Auditorium Sound System Complete

Civic Auditorium is to have a new public address system which will be ready for use within a month.

The new 16-unit system has been specially designed for the Auditorium by the Jennings Radio Manufacturing Co. of San Jose. City of San Jose electricians will install it under the supervision of company engineers.

The present system of seven units has been found inadequate, according to Auditorium Manager Jay McCabe.

The new system will completely cover the hall, Jo Emmett Jennings, company engineer, said yesterday. He explained that the new ion will have special n for use in radio broad- ithout use of additional ones. This was a fault of system. There will be a e radio control room for sts.

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Dear Biographee:

The enclosed biographical reference sketch of you has been prepared from the data which you so helpfully made available some time ago. It is now sent so that you may have an opportunity to check it before the printing of the first Marquis Edition of Who's Who on the Pacific Coast.

That printing, the first issuance under the title by the A. N. Marquis Company - publishers of "Who's Who in America" - will be an entirely new compilation of the life-records of citizens of the Pacific Coast States carefully selected under Marquis standards of reference usefulness based on a half century of experience in publishing biographical dictionaries in reference service throughout the world. Analyses made by our editors in connection with trade-name and copy-right legal actions - the publication recently using the title Who's Who on the Pacific Coast is now in our hands - convince them that reference utility justifies a regularly-issued and adequately-edited Marquis work under the title.

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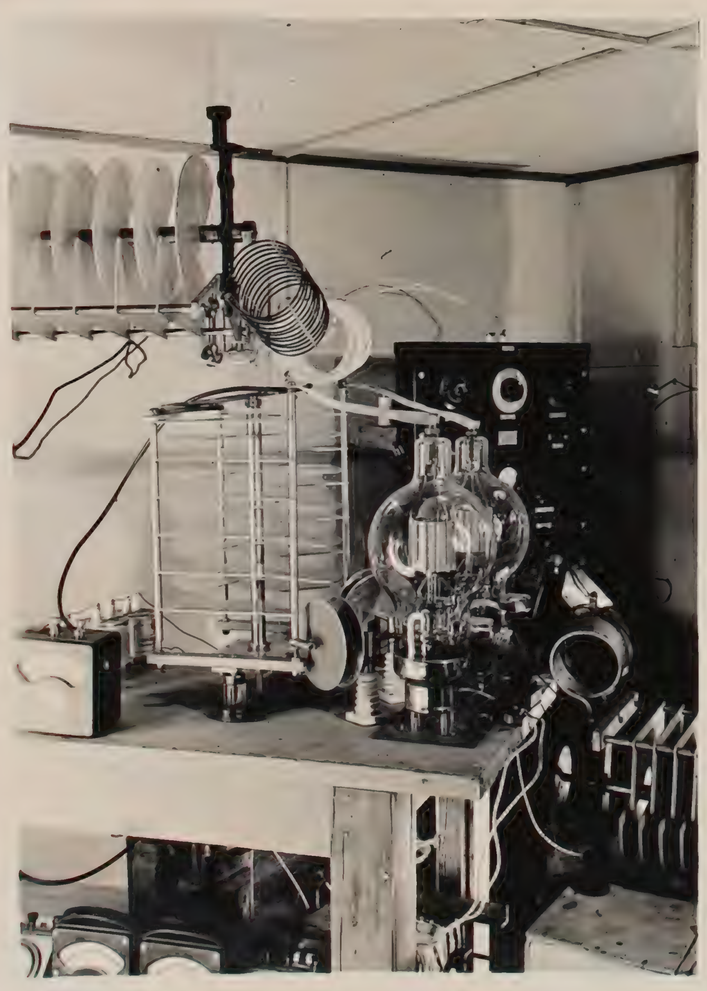
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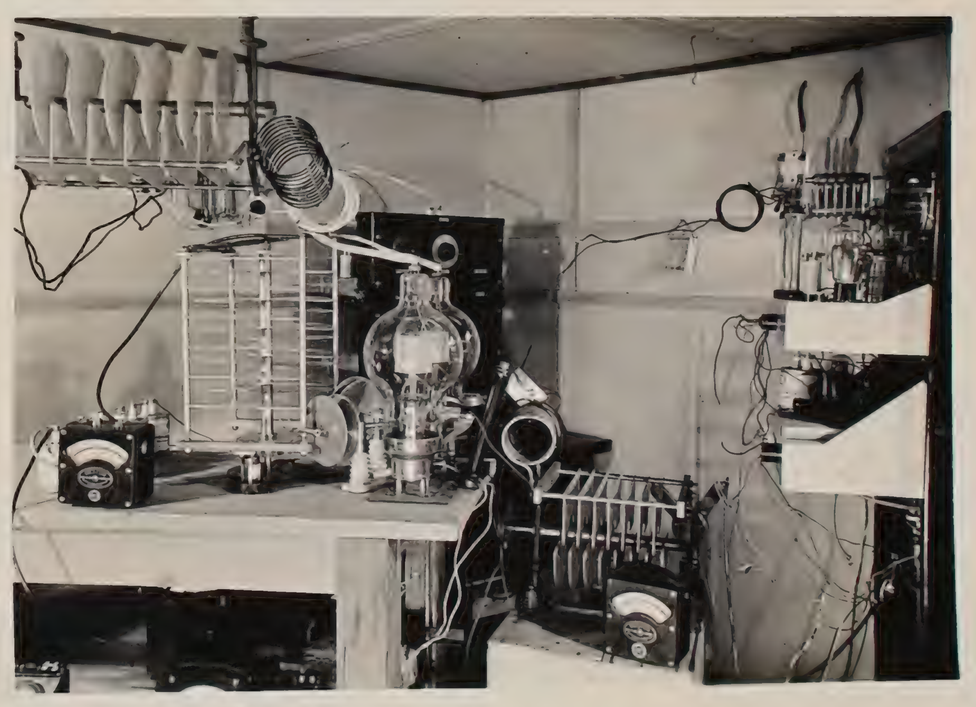
Wheeler Sammons Jr.

Wheeler Sammons, Jr.
Editor-in-Charge

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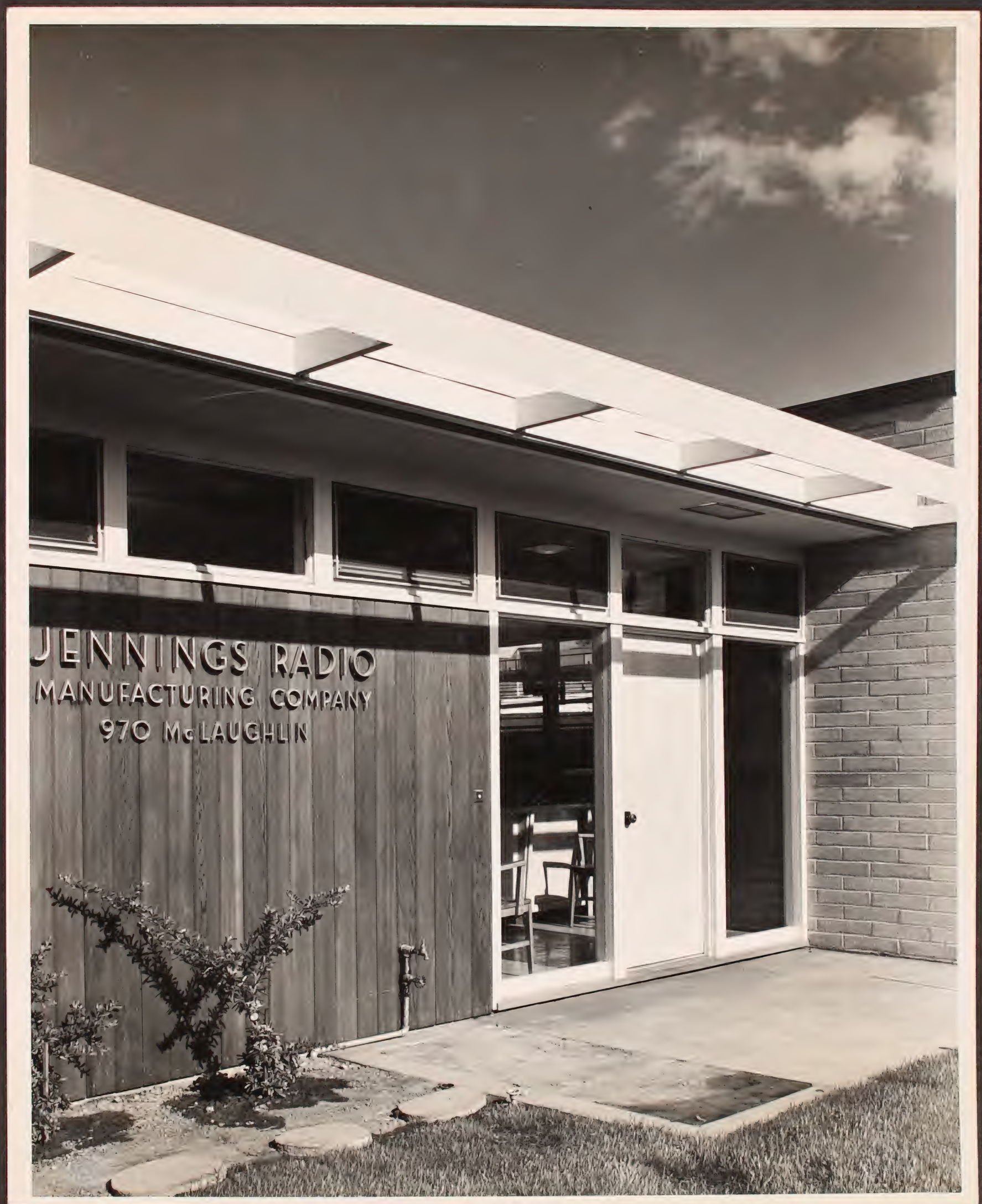




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June 6, 1950.

Mr. Joe Jennings,
Jennings Mfg. Company,
1098 E. William Street,
San Jose, Calif.

Dear Mr. Jennings:

On behalf of the Associated Public Communication Officers I want to take this opportunity to express our sincere appreciation and thanks to you for acting as one of the instructors in Communication Equipment at the APCO Communication Officers School held at Santa Rita, California during the last week of April.

Your lecture was of great interest to all and your cooperation helped to make our first school a great success.

Again our thanks.

Very truly yours,

ASSOCIATED PUBLIC COMMUNICATION OFFICERS

John H. Atkinson

John H. Atkinson, Secretary,
528 Tully Rd.,
San Jose, Calif.

ROY E. SIMPSON
Superintendent of Public Instruction
and Director of Education

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DIVISION OF INSTRUCTION
COMMISSION FOR VOCATIONAL EDUCATION
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Information and Guidance

SAMUEL L. FICK
Chief, Bureau of Trade
and Industrial Education

JULIAN A. McPHEE
President, California
State Polytechnic College

June 26, 1950

Mr. Jo Emmett Jennings
316 South 18th Street
San Jose, California

Dear Mr. Jennings:

We are enclosing a State of California Pay Check in the amount of seven dollars and fifty cents ($7.50) in payment for services rendered in the California Technical Institute of Peace Officers' Training.

Your participation in this program conducted by the Bureau of Trade and Industrial Education under the provisions of the California Plan for Trade and Industrial Education is keenly appreciated. We thank you for your interest in making this program a success.

Very truly yours,

Samuel L. Fick

Chief, Bureau of Trade
and Industrial Education

New Plants to Mean More Jobs Here in 1951

A promise of several hundred new jobs through industrial growth is on the board for the Santa Clara Valley in 1951, as this year ends with activity showing nearly 450 jobs created by new industries and existing expansions.

The new year, despite uncertainties of the Korean war, holds new jobs in the completion of plants started this year and expected to be finished in 1951.

In addition, eight firms have purchased land and have announced new construction projects to be completed in 1951.

PROJECTS AHEAD

The 1951 new industry outlook is highlighted by the scheduled construction of a new asbestos products manufacturing plant for Keasbey & Mattison on Lafayette St. and Kifer Road. The firm, in October, purchased a 26-acre site in the Pasetta Industrial tract. The investment will be approximately $2,500,000. Employment will be 250 persons, eventually. No date for construction has been set.

Pacific Electric Manufacturing Co., now in leased quarters on S. Monterey Road, will occupy a new $500,000 plant next year. Steel framing is now up on the 23-acre factory site on Brokaw Road near Southern Pacific right-of-way in Santa Clara. The firm will make air brake switches, oil circuit breakers, frames and switches. Employment will be 200 persons. Ground was broken for the new plant in September.

Sometime in 1951 Ferry-Morse Seed Co. is expected to start production on its new $2,000,00 plant in Mountain View. In June the firm purchased a 14-acre site to accommodate operations to process seed crops grown on the company's 30,000 acres in California, Oregon, Washington and Idaho. Nearly 200 persons will be employed here.

ANOTHER NEW PLANT

Another new industry, Milwaukee Lace Paper Co., is earmarked for a four-acre site on Walsh Ave. Santa Clara. The firm will employ 35 persons, mostly women, in the manufacture of paper doilies, paper fruit cups and drinking cups and restaurant place mats. Work on the $150,000 plant started last October.

Construction is well under way on the Technical Coating Company plant near the Milwaukee Lace Paper Co. site on Walsh Ave. The investment represents nearly $90,000 and will result in manufacture of industrial finishes, including coatings used in decorating and special finishes. The firm also will manufacture master paints. Operations will start early next year.

Underwriters Laboratories last July purchased a seven-acre site of El Camino Real and Scott Lane to construct a plant headquarters. Approximately 30 scientists and technicians will be moved to San Jose from the current San Francisco headquarters to test electrical equipment and heating devices.

McCormac & Co., which recently closed a plant in San Francisco, bought an eight-acre site in Pasetta Industrial tract in Santa Clara for an $80,000 plant to manufacture pallets.

PLANT IN PRODUCTION

Sutherland Paper Co., with headquarters in Kalamazoo, Mich., is now in production after completion recently of a plant representing a $1,000,000 investment. The company eventually will employ 150 persons who will be engaged in manufacture of paper plates and cups.

Felton Aluminum Co. plans to build a new plant in 1951 for the manufacture of castings. The firm purchased a site in Pasetta Industrial Tract last October.

Scheduled for completion in 1951 is a new $3,500,000 project at Permanente Cement Co. Employment at the plant will be increased by 50 persons with the addition of a new kiln and electrically operated precipitators for controlling dust.

Jennings Radio Manufacturing Corp. has announced a $50,000 expansion of its facilities on McLaughlin Ave. and Story Road. Construction is expected to start in 1951.

EXPANSION PLANNED

Monsanto Chemical Co., which is in production now, purchased an additional eight acres in the Pasetta Industrial Tract for proposed expansion of its operations in the future. The company's plant was dedicated last September. The firm makes synthetic resins and specialty coatings. Present employment is nearly 50 persons.

Further indication of industrial activity is in purchase by the Western Pacific of a 70-acre site in southeast San Jose for an industrial tract. The location is near McKee Road, Mabury Road, King Road, Bayshore Highway and the Western Pacific tracks.

All in all, 52 new plants with capital investment of more than $3,000,000 and 58 expansions costing $6,650,000 were reported by the San Jose Chamber of Commerce Industrial Department this year. The nine firms that have bought land and plan expansion in 1951 or are now in the progress of construction represent a capital outlay of $5,590,000. In the past six years new industries have invested nearly $51,000,000 in the community.

Radio Plant Contract Let

A $50,000 contract for construction of a manufacturing unit addition to Jennings Radio Co., Story Road and McLaughlin Ave., has been awarded to Lew Jones Construction Co.

The work is expected to begin this week. The 7000-square-foot building will include offices and floor space for machinery.

The firm manufactures vacuum electronic components, including vacuum capacitors and vacuum switches. The products are used in cyclotrons and other electronic equipment, according to company's spokesmen.

Dec. 31, 1950









A big crane hoists one of the prefabricated panels (8x16 feet) of basalite as construction goes ahead on the new addition for Jennings Radio Co., Story Road and McLaughlin Ave. The construction started day before yesterday and is expected to be completed by tomorrow or Friday. Floors will be laid and equipment installed after that. Production is not expected to be under way until a month or so. The new unit is necessary for enlargement of the firm's manufacturing operations to meet increased demands brought about by defense contracts. The firm makes vacuum electronic components, including vacuum capacitors and vacuum switches. Building is being erected by Lew Jones and represents an approximately $50,000 investment.

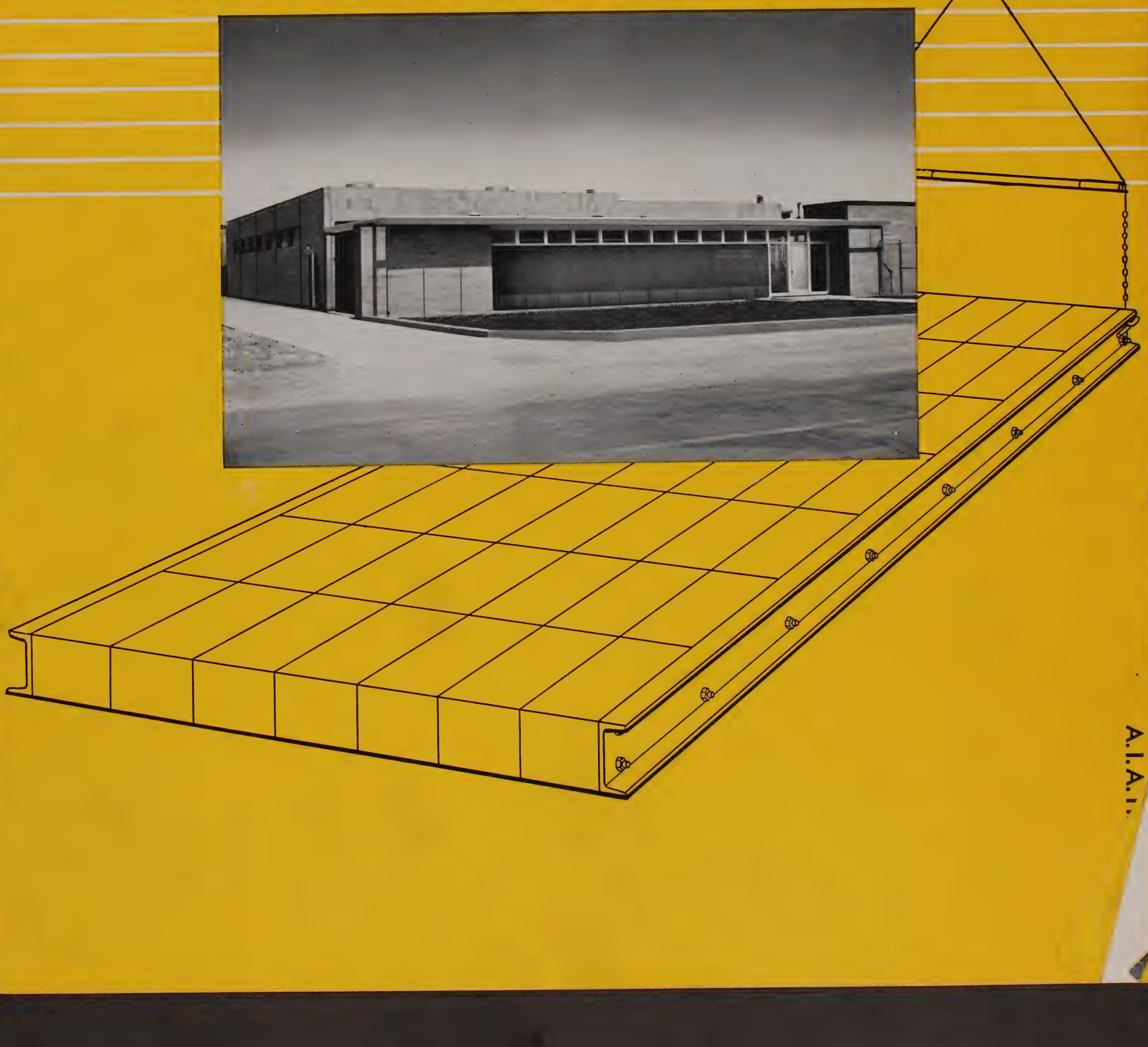


A.I.A. File No. 17A

STRESTCRETE

INTEGRAL STEEL FRAME

BUILDINGS



A.I.A. F...







































SAN JOSE HIGH SCHOOL

SAN JOSE UNIFIED SCHOOL DISTRICT
SIXTH AND SAN FERNANDO STS.
SAN JOSE 14, CALIFORNIA

BEN SWEENEY
PRINCIPAL

EARLE P. CRANDALL
SUPERINTENDENT OF SCHOOLS

January 21, 1952

Mr. Joe Jennings
Jennings Radio Manufacturing Co.
970 McLaughlin Avenue
San Jose, California

Dear Mr. Jennings:

This opportunity is taken to say a very sincere "thank you" for your participation in our Sophomore Vocational Conferences on Tuesday, January 15. An appraisal of the program by the students the day following the conferences, indicates that the students derived great value from and were highly interested in your talk. It is my hope that this feeling on the part of the students will constitute sufficient reward for your participation.

Our counselors have made several suggestions designed to improve our program for next year. If you have any ideas growing out of your meeting which we might use to make the program more effective, I should appreciate hearing from you.

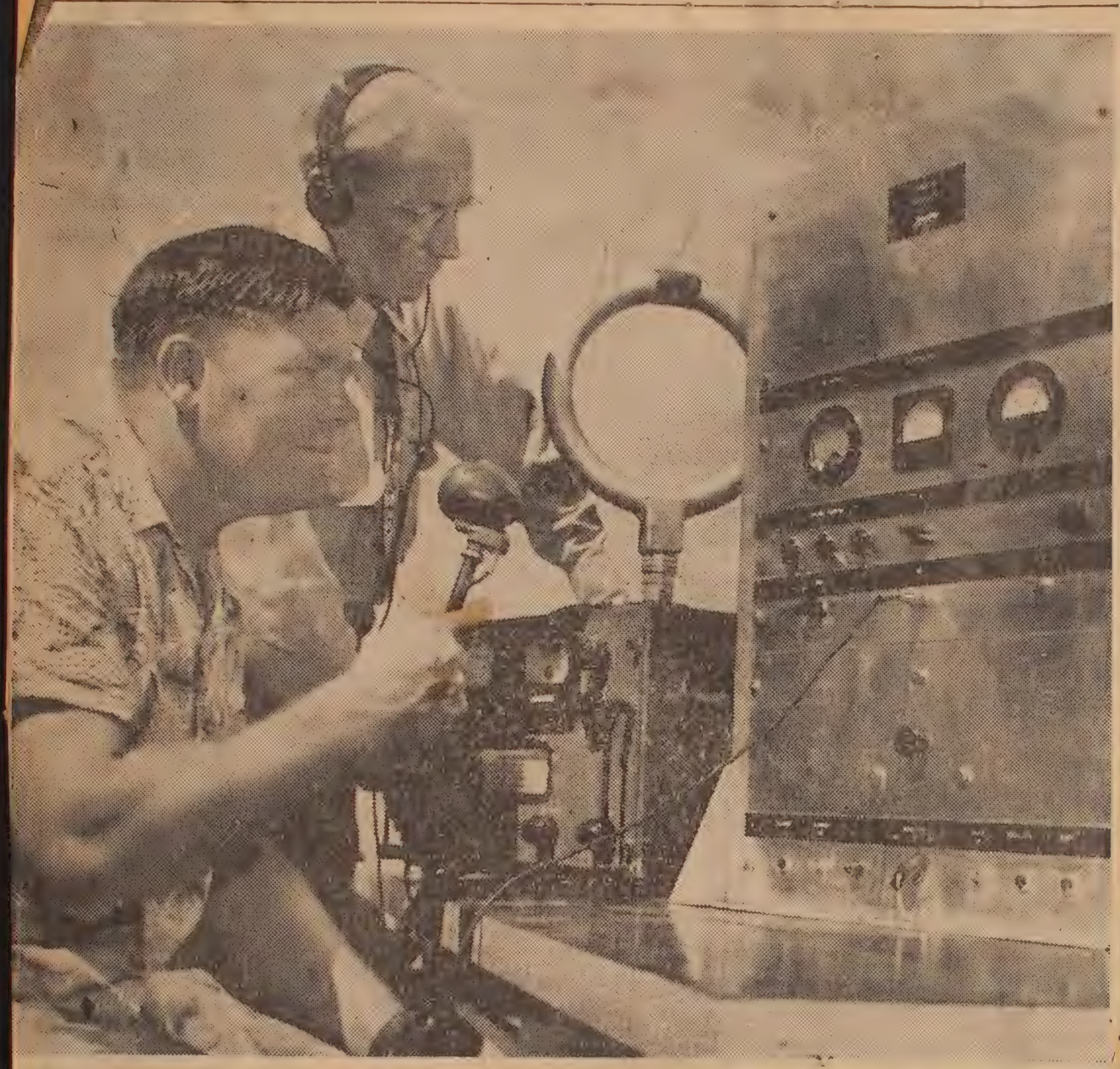
Once again, your help is most appreciated.

Sincerely yours,

Ben Sweeney

Ben Sweeney
Principal

ems



Joe Jennings, with microphone, and Henri Kirby, San Jose city communications chief, are cooperating in an experiment which may eventually develop an acceptable radio fire alarm system, costing much less than present installations approved by the National Board of Fire Underwriters. The panel at right is an experimental transmitter. The box with the loop is a field strength meter, for testing dependability of signals.

GREAT POSSIBILITIES

Radio Fire Alarm Plan Being Developed Here

By HARRY FARRELL

With an optimistic progress report, the curtain was partially lifted here today from a quiet series of local experiments which could eventually revise the fire insurance rating system for the entire Nation.

Although practically no general publicity has been given the local research, informed municipal officials all over the United States are watching it with keen interest.

The experiments are in progress at the Jennings Radio Manufacturing Co. on McLaughlin Ave. just north of Story Road. They are cosponsored by the Jennings firm and the City of San Jose.

RADIO ALARM SYSTEM

Their goal: To develop a radio fire alarm system which could supplant the conventional alarm boxes now universally used in this country, at one-tenth to one-third of present costs.

Today, most American fire alarm systems are manufactured by the Gamewell Co. of New York City. Gamewell's fire alarm boxes transmit their coded alarms via cables, just as in the telegraph or telephone.

One of the reasons only Gamewell equipment is used generally is that the National Board of Fire Underwriters imposes standards of performance and design which few of Gamewell's competitors can meet.

And since the underwriters are responsible for the ratings which determine fire insurance rates, their word is practically law for the operations of fire departments.

One of the underwriters' basic rules, according to San Jose Fire Chief Lester A. O'Brien, is that no credit can be given for alarm systems depending upon radio transmission.

So if the Jennings system is ever approved a lot of "selling" will have to be done first.

According to Joe Jennings, proprietor of the local firm, his system has overcome several of the chief objections to radio which have been voiced by the underwriters in the past.

A first requirement is that a

(Continued on Page 4, Column 3)

Radio Fire Alarm Being Tested In S.J.

(Continued From Page 1)

transmitter be designed which is compact enough to occupy about the same space as an ordinary fire alarm box, and at the same time, be practically indestructible and foolproof.

It must be able to send an absolutely dependable code and/or voice signal at all times, and furthermore, this signal must be closely controlled. It cannot travel too far, or it might turn in a false alarm in another city somewhere, using the same sort of equipment. It must be directional—that is, it must be beamed strongly toward the central communications center; otherwise, it might interfere with alarms from other boxes.

Jennings believes he is now well on the way toward eliminating the difficulties which have shown up in all previous radio alarm research.

He calls his set-up the "Jennings-San Jose ground wave radio alarm system." He has had a transmitter in operation for several weeks, and trials have been extremely encouraging, he says.

The essence of the Jannins system is that the antenna is underground. In normal radio transmission, the signal is carried by both "sky waves" and "ground waves" traveling through the air and earth, respectively.

ANTENNA BURIED

By burying his antenna, Jennings practically eliminates the sky wave. This is necessary because radio signals travel via sky wave in an unpredictable manner. There is no way of controlling their range. They can hit an ionized layer in the atmosphere and bounce most anywhere, sometimes strong, sometimes weak.

Ground waves, on the other hand, are much more predictable. The distance they travel can be closely controlled by the variation of the power used.

The necessity for a directional signal has been met by the design of Jennings' antenna, still subject to change. He has now discovered that a dozen 18-inch loops of ordinary copper wire, in a certain position, will emit a signal almost seven times stronger in the desired direction than in the direction at right angles.

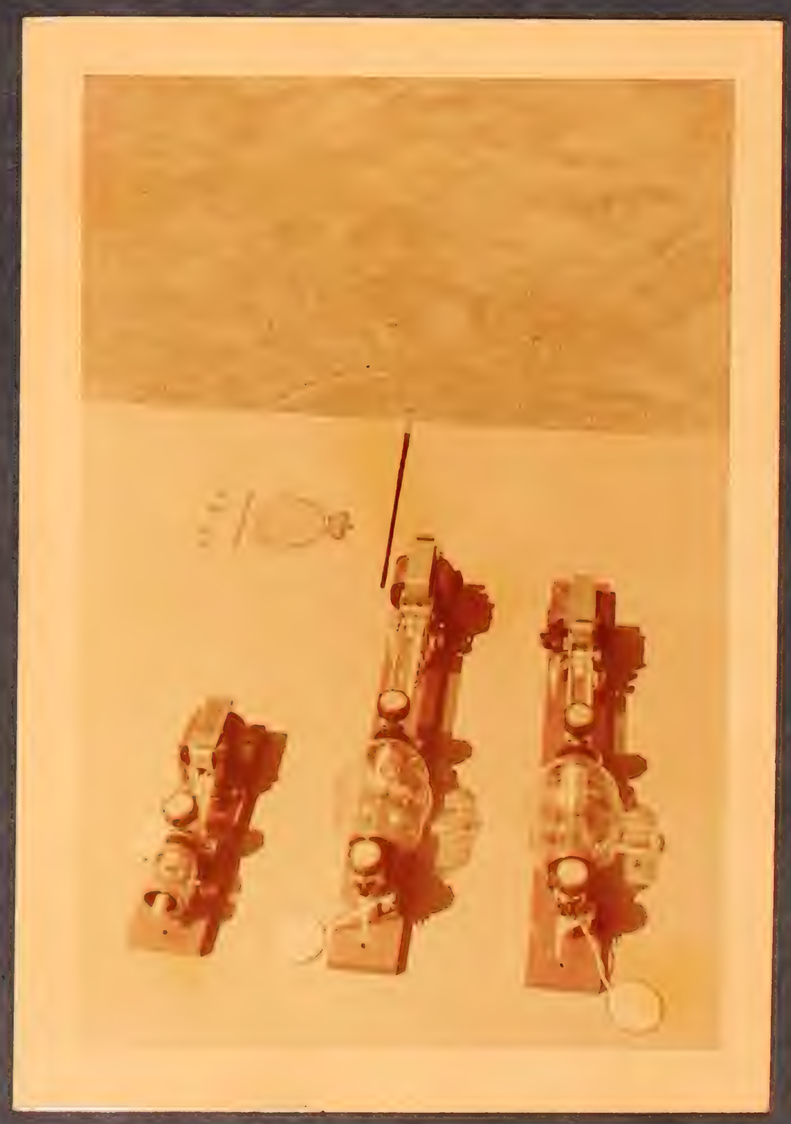
The City of San Jose appropriated $500 toward the experiments, and aid may be solicited from other municipalities. City Manager A. P. Hamann is following the work closely.

Fire Chief O'Brien takes a dubious view of the experiments, however.

"I have been told by a representative of the underwriters that experiments of this nature have been in progress for years without success," he said this morning. "If those people at Jennings' place have really succeeded, they're not just millionaires—they're billionaires."







JENNINGS

VACUUM CAPACITORS—FIXED AND VARIABLE

For applications involving:

★ Automatic tuning over wide frequency ranges
★ Permanent and trouble-free service
★ High ratio of capacitance change
★ Dust, moisture, and high altitude
★ High voltages and currents
★ Small physical size
★ Resistance to shock
★ Accuracy of reset
★ High frequency
★ Low loss

Voltages	up to 65 KV
Currents	up to 400 AMP
Capacities	up to 2,500 MMFD

Jennings RADIO
VACUUM ELECTRONIC COMPONENTS



Aerial view of the Jennings Radio Manufacturing Company at San Jose, California













JUNE TARGET DATE Jan. 20, 1957

Jennings Radio Plans Expansion

Jennings Radio Manufacturing Corp., one of San Jose's leading and pioneer electronics firms, started in 1941, has launched a $429,000 expansion program at its 970 McLaughlin Ave. plant site.

Plans call for construction of a 38,000 square foot manufacturing and office building to bring total space to more than 80,000 square feet. E. A. Hathaway is contractor, while Kingsford Jones is architect. Completion is due in June.

Jennings now has a 17-acre site with four acres acquired several months ago. Employment of 265 now is expected to reach 475 ultimately.

C. K. Townsend, executive vice president, and Joseph Jennings founder, said the firm is primarily a producer of vacuum switches for communications, military and electrical power transmission fields. Designed in the firm's own laboratories here, the switches are highly unique, efficient and replace bulkier and heavier equipment which has long been standard.

In addition, Jennings specialized electronics equipment is widely used in commercial broadcasting, military products, and in the nation's atomic energy program. Some products are exported in quantity to Germany, Western Europe, South Africa, Canada and Formosa.

The firm has one of the largest high-power testing laboratories west of Chicago to test electrical power products. Also in heavy use is a very large radio frequency testing laboratory which can accommodate RF transmitters of 100 kw power.

The firm takes no military research and development projects as a subsidy. Instead, Jennings technicians and engineers accept a problem, work out a solution and product, and then offer its use to military services on a tested and production basis in competition with the industry.



S.J. Electronics Firm Moves Up In New Fields

Survival in the electronics manufacturing industry after World War II in this area, with restricted market, meant inventiveness and the ability to produce something nobody else was, San Jose Chamber of Commerce members heard recently from Calvin K. Townsend, vice president of San Jose's Jennings Radio Manufacturing Corp.

So Jennings has gone in for vacuum variable capacitors, high-power linear amplifiers, vacuum switches of all types handling up to a million volts, coaxial and vacuum relays, triggered spark gaps, high voltage measuring equipment and the like.

During the last war, Jennings turned out large quantities of electronic equipment for the military services, then found inself loaded with a lot of surplus raw materials, a good organization, lots of know-how, but no market or sales staff.

It had to go into a field nobody else was exploring and vacuum capacitors was the answer. Today its capacitors have become standard on nearly all electrical equipment in all parts of the world.

Townsend recalled a tense moment when the authorities at Bonneville Dam on the Columbia River approved a Jennings request to demonstrate its vacuum switch — but on a 230,000-volt line! A new oil circuit breaker had failed four times on voltage of that power, capable of a 20-foot arc.

When Jennings' men arrived, they were surprised to find present 25 electrical engineers from all over the country.

A dozen Jennings tubes were hooked up. Everybody cleared away from the immediate area in case of a blow-up of some sort. The switches took the test in stride. Then the engineers began to test fewer and fewer Jennings switches in the hookup until they finally got down to three, which stood the test.

Those tests catapulted Jennings into the vacuum switch field in a big way, said Townsend.

Only this week, the company received an order for switches to handle 230 kvs. It also is working on switches for a 320 kv. plant in Australia.

The switch is only about eight inches long and only a few inches in diameter but four or five of them hooked up in a team will do the work of a big oil circuit breaker and do it better, said Townsend.

Jennings maintains a large testing laboratory to give electronic devices tests and worse abuse than they will get when they go into actual use.

Townsend was presented to the Hotel DeAnza gathering by Halsey Burke.

* * *

The local radio ham who had the most fun last Saturday was Jo Jennings, W6EI, head of Jennings Radio Mfg. Co. He rode that retired locomotive from the round house to the Fairgrounds as radio operator. Had a two-meter outfit with a 10-foot antenna that had to be lowered whenever the entourage came to a power line. Receiving Jo's radio reports of progress at the Fairgrounds was Paul Barton, W6JAT, who works for Jo. Another ham, Dr. Bob McCormack, K6DV, recorded the whole event. . . . Understand that Russ Pettit, who for years was manager of the Fair and ineligible to compete, sneaked over to the agricultural department after dark and handed Wes Hoover four butternut squash from his backyard, the whole thing being done under wraps so as not to spook the competition. Russ confided that he was after a sweepstakes award, which means his entries will have to take first and second prizes of $3 and $2 to be eligible. Sweepstakes award is $15. . . . Don't complain if it seems warm at the Fair. After all, the heat is in-tents.

County Fair
September, 1957

Honor For Joe

5-18-56

Joe Jennings, a home-grown industrial tycoon who built an electronics plant in a local prune orchard, received a special sort of honor a few days ago.

Every year a Eugene, Ore., ham radio group called the Ham Slicers presents a trophy to the one who has done the most to develop the single sideband technique of voice transmission. This year the Ham Slicers awarded the trophy to Joe, whose crew at Jennings Radio has, under his direction, made some real developments in the field.

The trophy was unique, too. A radio signal carrying voice normally has two sets of sidebands, but in the new method one set is cut off—so the trophy was a stauette of half of a female figure. Paul Barton represented Joe at the convention at which the presentation was made.

★ ★ ★

VALLEY RADIO CLUB

of EUGENE, OREGON

CLUB STATION W7PXL

Meeting 1st and 3rd Wednesdays

828 Olive

April 24, 1957

Mr. Jo Jennings
Jennings Radio Co.
San Jose, Calif.

Dear Jo:

It was indeed a pleasure to meet you and to have your help in making our Oregon Amateur Radio Association convention a great sucess.

Our total attendance was 326 amateurs and 104 non-amateurs, which is a pretty fair representation of the group in the Oregon area. Perhaps if we could have had the affair a little bit later in the year, we could have boosted that number by another hundred. However, it was the only free week-end thru the fall period.

Again this year, there have been many letters from the gang telling us what they liked, as well as long discussions over the air. Many of the letters and the discussion have mentioned that amplifier and all those pretty vacuum condensers. Perhaps soon I can get away from the 20A barefoot and get an amplifier constructed so that we can thank you over the air.

Thanks, from all of us, Jo, for making it a grand convention. Perhaps the enclosed picture can be added to others in your collection to remind you of the Oregon gang.

73
Jim

Jim Walsh, W7LVN
Convention Chairman



OARA - Eugene, Ore - 1957

ANNCR: We tried like crazy to get an animal act for this point of the show, but the trained seals and dog acts are all busy on TV this time of year.....however, we are going to fill this part of the show with what we feel is an appropriate substitution..... All of you at one time or another have heard officials of industry being introduced.....the words are well chosen and carry great impact.....we too felt that when the officials of our company were presented to you today, it should be done with all of the right amenities.....all of the right, well chosen words..... In order to do that .....Bud, will you hand me those papers with the introductions on them?.....

First, the founder of our company, a man who quite probably is more like a little Christmas elf.....??????(double take to rear)... (testily) than anyone we have ever known.....(big again)... a man who thru sheer perseverance, and dogged determination, has more fun (drift and lighten) doing what comes naturally to him, than most comedians do in front of a camera.....(sigh) A man whose enervating, radiant personality pops up all over the plant... like a crew cut jack in the box.....A man.....who..... ladies and gentlemen.....the President, Jo Jennings.....and the guiding light behind that bubbling personality, his boss, Mrs. J...

All departments get together in the new building for the Christmas Party, 1957 (All entertainment was by plant personnel.)





Christmas Party at Jennings Radio in New Building 1957















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Registered in U. S. Patent Office

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BOSTON, SATURDAY, FEBRUARY 1, 1958 PACIFIC EDITION TWO SECTIONS TEN CENTS A COPY

U.S. Breaks Earth Chains With 'Moon'

Triumph for Army

By Courtney Sheldon
Staff Correspondent of The Christian Science Monitor

Washington

The United States has leaped upon a stairway to the stars with the wonders of the universe beckoning beyond.

Explorer I, the eye and ear of the earthbound natural scientist, is only a veiled hint of what is to come. Successive generations of more sophisticated space-probing rockets will be blasted aloft in the months and years to come.

As knowledge from the pioneer rockets accumulates, venturesome men will condition themselves for the first encounters with space environment, trips to the moon, and the other planets.

Here on the Washington ground where political sensitivities are acute, the Army's achievement has brought both acclaim and relief.

"I knew we would do it," said a soft-spoken night-watch elevator operator in a Hungarian accent.

Quietly Jubilant

"All I can say is 'whew!' " said a pleased and relieved Navy veteran of 19 years' service, not unmindful that the Navy would have liked to hurl its Vanguard satellite into the sky long before this.

On the whole Washington was jubilant, but quietly so. In almost everybody's thinking was the previous achievement of the Soviets in launching two satellites, both larger than Explorer I. And there have been reports the firing of a third is imminent.

In the dawn hours after the launching Dr. Wernher von Braun, the Army's missile team chief, was the toast of the town. He and his colleagues were jubilant at a hastily called press conference.

The slow-to-demonstrate press corps this time burst into applause at their appearance. If Washington were London, Dr. von Braun would have been knighted before sunrise.

Dr. von Braun, a zealous advocate of an integrated outer-space program since the days when he helped Germany develop the World War II V-2 rocket, has insisted for the past several years that the Army could launch a satellite if given the go-ahead orders.

Started From Scratch

But the Pentagon decided that the satellite program should be started from scratch so as not to interfere with military missile development. The Navy was assigned to do the job but given precious little financing and priority to do it adequately. Too "Buck Rogerish" a project, said the policy makers in explanation.

Then the Soviets rose to the occasion and scooped the glory that the United States once thought would be its own.

The Navy was needled to go faster. It did, until the intricate, temperamental plumbing of rockets slowed down progress. The new post-sputnik administration of the Pentagon then rushed in the von Braun team with the same Jupiter-C it wanted to use two years ago.

The Army now is definitely off the ground. If it presses its new prestige to advantage it could be given a major share of the missile pie. Others will see the satellite episode as further cause for unification of the services.

The near-midnight launching of Explorer I caught most congressional mimeograph machines unattended. Those congressmen and officials who awoke quickly the morning after glowed with pride, though some reflected on the lateness of the hour in the missile satellite race.

James C. Hagerty, White House press secretary, kept President Eisenhower informed of the preliminary launching progress through the evening.

At 1 a.m. Mr. Hagerty issued a formal statement from the President. He said the President's reaction on hearing the climactic news was "That's wonderful!"

In the prepared statement, the President emphasized that the launching "is part of our country's participation in the International Geophysical Year. All information received from this satellite promptly will be made available to the scientific community of the world."

Almost unnoticed in the hubbub was another statement by United Nations General Assembly President Sir Leslie Munro of New Zealand made hours before the launching. He suggested a UN conference of natural scientists and diplomats within the next two or three months to study control of outer space.

According to Sir Leslie, there has been no initiative, "except in embryo" to bring the issue to the UN.

Issue Seen Waning

The ever politically attuned Vice-President Richard M. Nixon about two hours before the ascent of the rocket told fellow Republicans that missiles will not be an issue in the November congressional elections.

"Every time we have a successful test of a missile," he said, "the issue becomes less effective. When we have an effective launching of a satellite—there will be one before November, months before—the satellite issue will become less effective."

This is an argument that not everyone in Washington is ready to agree with, even as the sun rises on the day after the first launching. What critics of the defense and satellite program have been hammering on is the rate of progress being made in the United States as compared to that made in the Soviet Union.

Neither countries threw rockets beyond the atmosphere overnight. Years of planning and fabricating of hardware preceded; it remains to be seen whether the satellite-a-month goal of the Soviets is met. If it is, the missile competition, from a political and psychological standpoint, will not be viewed much differently here than it is at present.

Killian Advises Study of Russian

By the Associated Press

New York

More Americans should be studying Russian, President Eisenhower's scientific adviser said.

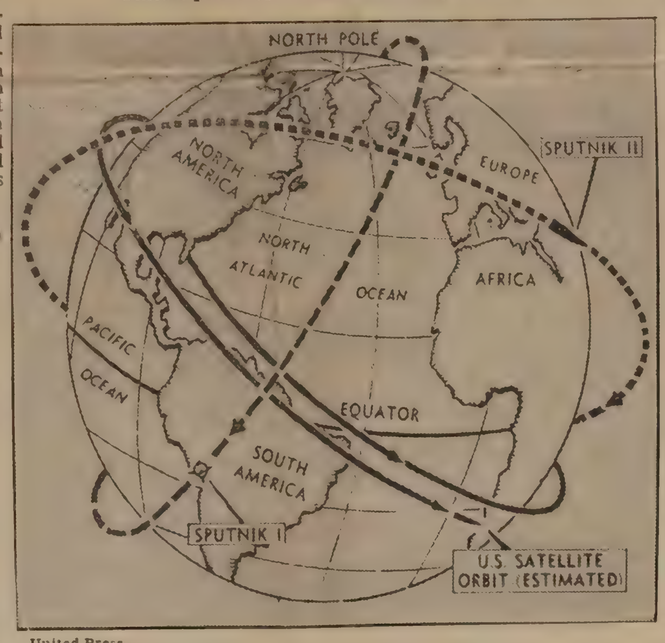
Dr. James R. Killian, Jr., discussed the problem in a speech before the joint banquet of the American Institute of Physics and American Physical Society Jan. 31.

"Not only do we need more people who can do the translating that we need; we also need more scientists who can read Soviet scientific publications for their own benefit," he said.



United Press from United States Air Force

Army's Jupiter-C Whooshes Spaceward
Official photo of Florida launching on Jan. 31



United Press

Likely Orbit of U.S. Explorer Satellite
Broken lines show orbits of Soviet Sputniks I and II

Space Threshold

By Robert C. Cowen
Natural Science Editor of The Christian Science Monitor

The United States has sent a messenger of its own to join the Soviet sputniks in heralding the dawn of the space age.

Its first artificial earth satellite—the 30-pound Explorer—now is circling the world once every 106 to 113 minutes.

This is high-flying proof that the United States Army could do what it has long claimed, namely put an unmanned satellite into orbit with the aid of its Jupiter-C rocket.

The achievement is largely that of the famous rocket scientist, Dr. Wernher von Braun. In all likelihood it could have been accomplished a year or more ago. Dr. von Braun has maintained for many months that his rockets were ready and able to launch such a satellite.

Now these rockets have put a 6½-foot cylindrical vehicle into an elongated orbit that carries it to distances varying between 230 and 2,000 miles beyond the earth.

No Physical Match

This modest satellite is no physical match for the Soviet sputniks. But its successful launching is a very respectable achievement nonetheless.

Sputnik I was a sphere weighing about 184 pounds. Its orbit carried it to a maximum height of 560 miles.

Sputnik II was a long cylindrical vehicle weighing some 1,120 pounds and carrying a dog. It reached maximum heights of something just over 1,000 miles.

The difference in maximum altitudes reached by the two sputniks and Dr. von Braun's Explorer is more fortuitous than significant. This depends on such things as the speeding and heading of the satellite at the moment its final rocket motors cut off. These are difficult to control precisely.

In the case of the Explorer, these factors have cooperated to put the satellite into what one natural scientist called a "splendid orbit" that is "happily elliptical." It should provide a wide sampling of space for the cosmic-ray detectors the satellite is carrying.

Shallower Inclination

Explorer's orbit is more nearly parallel to the equator than those of the sputniks. These latter were inclined to the equator at angles of about 65 degrees. The much shallower inclination of the Explorer orbit means that the American satellite will probably not be carried over the Soviet Union.

Although its load-carrying capacity is more modest than that of the sputniks, the Explorer, like these earlier space-probing missiles, carries a variety of instruments whose measurements are radioed back to the ground.

These include instruments for studying cosmic rays and meteors. Temperature differences between the inside and outside of the satellite can also be studied by analyzing the radio signals sent back by two transmitters operating on slightly different radio frequencies. Their frequencies are affected by temperature and these effects can be detected at the ground.

Four-Stage Rocket

According to Dr. von Braun, Explorer was launched by a four-stage rocket.

The first stage, whose flaming motors eased the massive launching vehicle away from its pad late in the evening of Jan. 31, was a modified Redstone missile. This is the Army's 200 to 500 mile ballistic missile.

Dr. von Braun said that the modification consisted mainly of substituting a more powerful fuel for the alcohol used in earlier Redstones. Liquid oxygen is still used to make this fuel burn.

Like the two Soviet satellites, Explorer itself is aimed at peaceful but highly important scientific studies of the earth, atmosphere, and neighboring interplanetary space. But, also like its predecessors, it has overtones of cold-war competition.

Its success will help restore some of the technological prestige lost when Sputnik I was unexpectedly launched. But at the same time its modest size and weight indicate that the United States still has a long way to go to match that achievement.

A variety of plans are already being studied to follow these early American satellites with big heavy vehicles capable of carrying a host of instruments. These will include television cameras and telescopes to study the sun, moon, planets, and stars.

Coherent Effort

But, while the United States has to wait months or years for these follow-up projects, it is generally conceded that the Soviets can launch such elaborate satellites or even send an unmanned rocket to the moon whenever they want to.

The Soviet space-research program has been organized into a competent coherent effort for several years already. It has a good deal of momentum. That is why many American rocket experts have expressed doubt that this country can catch up to the Soviets in unmanned space-flight developments for years.

But the next really significant step forward into the space age future won't come from unmanned vehicles. It will be the successful launching and safe recovery of a manned satellite.

This is the development on which the great adventure of manned exploration of space now is waiting. The United States is believed to have a fighting chance to score a first with that achievement if it gets to work in an organized coordinated manner immediately.

Uncertainties Remain

Experts at the recent New York meeting of the American Astronautical Society reported that enough already is known to get this project started. The remaining uncertainties would likely be cleared up in timely fashion as the project progressed.

Indeed, some of the uncertainties lie in lack of knowledge of the density and composition of the upper air and of meteor phenomena in nearby space. These are the very kinds of data Explorer and the sputniks were designed to gather.

But cold-war competition notwithstanding, American space-flight experts are as excited as were the Soviet scientists at the sheer challenge that now has been opened to adventure out into the universe of stars and planets.

Dr. von Braun summed up his own and his colleagues' feelings when he modestly told the Associated Press, "This is the beginning."

Sputniks Larger Than Explorer

By the Associated Press

Explorer—the United States baby moon now girdling the globe—is considerably smaller than either of its two Soviet predecessors.

Explorer has a total weight of 30.8 pounds. Sputnik I totaled 184 pounds, while Sputnik II weighed 1,120.29 pounds.

Sputnik I, sent up Oct. 4, disintegrated Jan. 4 by Soviet calculation. Sputnik II, which went up Nov. 3 with a dog aboard, is still orbiting.

Explorer consists of a slender tube 6½ feet long orbiting at 18,000 miles an hour at a distance varying from 230 to 2,000 miles from the earth.

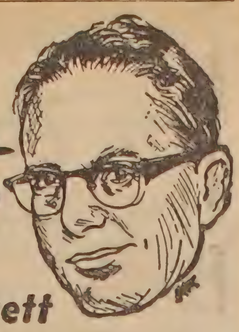
Sputnik I, a sphere 23 inches in diameter, attained the same speed as Explorer and ascended 560 miles. Sputnik II, said to be rocket-shaped, reached a speed of 17,840 miles and a maximum altitude of 1,056 miles.

Unofficial figures for the time it takes for Explorer to loop the globe range from 106 to 113 minutes.

Sputnik I started off with an orbit time of 96.2 minutes and shaved it to 94.72 minutes as it descended and its journey became shorter. Sputnik II's orbit time was originally given as 103.52 minutes.

The Sputniks were visible to the naked eye, but natural scientists said seeing Explorer probably would require binoculars or a telescope.

Share it with Barrett



By Dick Barrett

Local Product On Moon Rocket

A small electronics plant that sprang up among the prune trees on San Jose's east side some years ago had a part in launching the first U.S. satellite into outer space.

The Army Jupiter rocket that bore the artificial "moon" 2000 miles aloft carried one or more of Jennings Radio's vacuum capacitors aboard it.

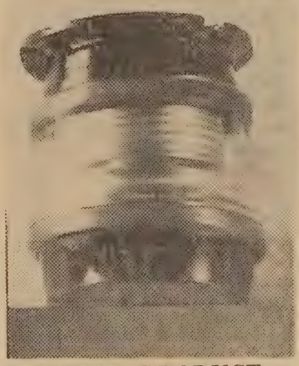
"These were specially designed for this application," Calvin Townsend, vice president of the company, says. "To give you an idea of how long these things take, we started working with them on it two and a half years ago."

★ ★ ★

A capacitor is a device which stores electric charges on two or more metal plates separated by insulation.

"Meeting high altitude complications is a very great problem," Townsend said.

The difficulty is in preventing the electric charge from leaping between the plates in the capacitors in the form of a spark. In the variable capacitors in your radio set, air serves well enough. But where high voltages are involved a gas under pressure or a complete vacuum are much better. The worst condition in a capacitor using air insulation exists at pressure which prevail at elevations between 100,000 and 180,000 feet. Above the latter height the situation is similar to a vacuum. Even at 50,000 feet the spacing of the plates has to be five times what it is at sea level.



LOCAL PRODUCT
Helped launch "moon."

Jennings Radio solved the problem by putting the capacitor in a high vacuum at the start. This is nothing new to Jo Jennings, the oldtime radio ham who founded the company and still directs all its engineering development. He and his crew have been making vacuum capacitors since the days of World War II.

In the case of the ones for the Jupiter missile, however, they had to be made unusually compact, designed to withstand strong vibration and extremes of temperature. (It gets cold 2000 miles out.)

★ ★ ★

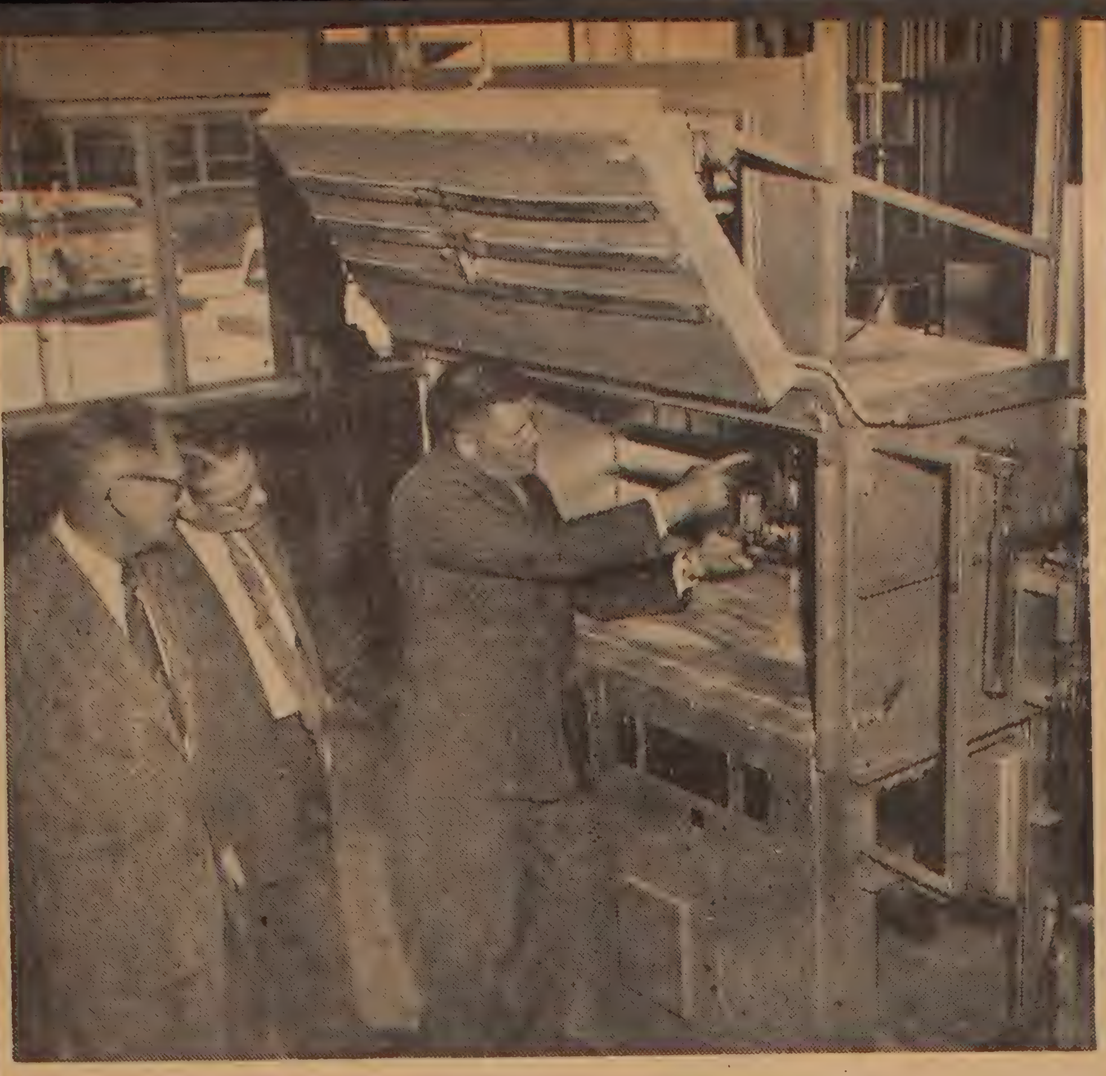
So far as I can learn, Jennings may have been the only firm in this area which had any of its products on the rocket or satellite.

Walter Cabral, general manager of Santa Clara's up and coming Dalmotor Co., wasn't sure whether any of his firm's products were on the Jupiter, although many of them are competing for a place in final rocket designs. (Up to now the rockets have been entirely developmental, with no two exactly alike.)

Myrle Sterns, president of Varian Associates at Palo Alto, said his company had no equipment on the Jupiter, but it is expected that the satellite which the Vanguard carries aloft will be equipped with a Varian magnetometer for measuring intensity of the earth's magnetic field.

★ ★ ★

Local IBM staffers were interested to hear that within 15 minutes after the "moon" launching, one of their company's computers was delivering orbital data to naval research scientists at 40,000 computations per second.





Industry Donates Materials For Electronics Studies

San Jose City College officials peer into mysteries of vacuum station being explained by Jo Emmett Jennings, president of Jennings Radio Manufacturing Co., San Jose for the new college course in vacuum tube technology. The machine was given to the college by Jennings. Left to right are H. R. Buchser, college director, and Charles Mulkey, coordinator of electronics department.

Stacks of supplies—some rare and expensive—lie in the new San Jose City College laboratory for vacuum tube technology. College officials have so far unpacked only a small part of materials. Looking at specimen materials is Joseph C. Bellenger, director of vocational education in San Jose schools.

S.J. City College Pioneering Class On Vacuum Tubes

SAN JOSE EVENING NEWS
Leased Wires from the Associated Press, United Press International and Wirephoto
SAN JOSE, CALIFORNIA, THURSDAY, JULY 17, 1958

By DWIGHT MITCHELL
News Staff Writer

regarded as fantastic—impossible; but he firmly believes the college is going to do it.

He knows of no school that offers such a course now. Industries and some universities train their own technicians now, but only unsystematically in connection with production; and this training takes a long time.

Mulkey and his associates at the college are firm in their conviction that the course they have developed can train in two years competent technicians badly needed by the vacuum tube industry.

Furthermore, the students do not require previous training in electronics before they start the course. Part of the their propram will be a course in introduction to electronics. The college will even make it possible for each nearby high school to enroll two carefully selected students, though enrollment will be limited to 20 to 25 students.

Joseph C. Bellenger, director of vocational education, explained that the course has been made possible by two things: first, a lengthy period of planning its contests and procedures, with extensive consultation with men in the tube industry; second, contributions from industry of a fantastic array of laboratory materials for students to work with.

Preparation has been under way for the past three years.

The tube technology program will be housed in a section of Technical High originally intended for agriculture classes. These classes were dropped several years ago and the space has been used several years by city collge classes.

One room of this section was recently piled high with cartons and boxes of equipment and supplies, given by local industries, some of it made of rare and costly metals.

In a quick tour through the area undergoing some remodeling in preparation for the tube technology program Mulkey pointed out several instruments for testing, a kick press and box after box of copper tubing; zirconium rods, wire and sheets, and component parts made of tantalum and pure tungsten.

There were anodes, cathodes, headers; more than 1,000 glass tube blanks, and pumps for creating vacuums in the tubes.

Students will learn the technology of producing microwave tubes, crucial in the fast-developing electronics field. In fact, microwave, Mulkey said expansively, "will make wrist-watch telephones common within the next decade."

Making the tube technology project all the more a pioneering venture, Mulkey explained, is the fact that it is primarily for research in developing new and improved vacuum tubes and improving existing models, and not merely for production of tubes.

This is a team job, with ideas full opportunity to advance to the status of an engineer and to as high a place in the tube industry as his ability and ambition carry him.

Bellenger, Mulkey and their associates are still classifying the windfall of materials given by local industries. They were not prepared to give an estimate of its market value, but said it is obviously a good many thousands of dollars.

Contributing firms were Stewart Engineering, Soquel; Varian Associates, Palo Alto; General Electric Co. microwave tube laboratory, Palo Alto; Sylvania Corp. microwave tube laboratory, Mountain View; Eitel-McCullough, San Bruno; Cascade Research, Los Gatos; Jennings Radio Manufacturing Co., San Jose; and Litten Industries, San Carlos.

Bellenger said material donated to the San Jose schools by other industrial firms will also be available for this course.

The college expects to turn out 20 graduates a year at the start, only a "drop in the bucket" of demand, Mulkey said. This class will be for regular day students in the associate of arts program. There will also be a night class for working apprentices.

Labor Day 1958—New Fields, New Techniques

SAN JOSE EVENING NEWS

SAN JOSE, CALIFORNIA, MONDAY, SEPTEMBER 1, 1958 25



In the three-quarters of a century since agitation started in this country for a special "day" to recognize Labor's role in the economy, the concept of "labor" has broadened enormously. Unions themselves, starting as organizations of workers skilled with their hands, have expanded to include many less skilled occupations and to cover hundreds of classifications of white collar workers. On this first Labor Day of the Space Age, the growing place of the electronics specialist and laboratory technician in the fields of manufacturing and servicing has been given increasing stress as missiles and satellite vehicles roar off the sands of Florida. Many of the component parts of these space vehicles are developed or manufactured in Santa Clara County and the highly trained "wage earners" who do the work form an increasing portion of the population. In the photo by Frank Slattery, Edgar Gentes, laboratory analyst at Lockheed, installs a coaxial wire to test antennae in a model of the Army's Kingfisher missile. And photographer Mike Conversa —another skilled worker who created this montage— caught the intent expression of Ray Gills of Jennings Radio as he worked on a superfast overload circuit breaker, which, in addition to being of value in radar and radio transmitters, will eliminate from power lines such arcs as the 13,500 volt flash across the top of the page.

Jennings of San Jose

Busy Firm Hatched in Chicken Coop

Horatio Alger stories are the rule rather than the exception among the scores of electronic companies that dot the peninsula south of San Francisco.

But no corporate "rags to riches" tale is more exciting than that of the Jennings Radio Manufacturing Corporation and the two men who have made it great.

Beginning 16 years ago in the narrow confines of a San Jose chicken coop, Jo Emmett Jennings, research wizard, and Calvin Townsend, brilliant industrial engineer, have written a saga of ingenuity.

For eight years the Jennings Corporation has averaged an increase of 15 per cent annually in sales and output. By the end of 1959 yearly sales should exceed $4,000,000.

In the year 1958 the latest of a number of expansions took place at the plant at 970 McLaughlin Avenue, San Jose, doubling the space and increasing employment to 334.

Each year 20 to 30 new manufactured products are added to the company's line, all conceived as a positive need in the fertile mind of boyish-looking Jo Jennings and his laboratory staff. The company owns 40 patents and has another 138 pending. Hardly a week passes that one or two applications are not sent to the U.S. Patent Office.

Of the 650 different products designed and engineered by Jennings and his staff a scant 15 have fallen short of spectacular success.

Ever since World War II Jennings Radio has been a dominant name in many fields of vacuum electronic devices. Its components include fixed and variable capacitors, transfer relays and power switches. The company's catalogue is a maze of such terms as non-thermeonic devices, vacuum dielectric and vacuum coaxial relays, confusing to a layman, but vastly impressive to scientists and engineers.

Almost a native son, Jennings, now 48, was brought to San Jose from Council Bluffs, Iowa, by his family as an infant. During undergraduate days at San Jose State College his major was music. But gradually his minor—electronics—began to attract more of his interest. After graduate work in science at the University of California he joined Eitel-McCullough, Inc., and was employed at its San Bruno plant for four years.



FOUNDERS OF JENNINGS Radio Mfg. Co., of San Jose, contrast two of the company's products. Jo Emmett Jennings, left, and Calvin Townsend, display a huge vacuum variable capacitor of 50,000 volts rating and a new sub-miniature model.

With endless new ideas buzzing in his active brain Jennings decided to go into business for himself. In one of those twists of fate which occur every so often in industry the paths of Jennings and Townsend crossed. They have made an excellent team. Older of the two by 10 years, Townsend handles sales and production. His snow-white hair is cut crewcut style and his alert eyes reflect the energy that has been so much a part of company growth.

Because the company operates in highly specialized fields, it operates no distributorships. Money saved through streamlined sales operations is ploughed back into the business.

Two other factors have contributed greatly to success. Everything the company produces is original and most of the products center around vacuum techniques developed by Jennings. Large American companies have spent more than $1,500,000 unsuccessfully attempting to develop a vacuum condenser. Jennings did it and with far less.

The vacuum switches designed and made by Jennings represent a radical departure from conventional switching methods.

Jennings, who is president and director of research, and Townsend, executive vice president and chairman of the board, have surrounded themselves with a number of other executives who match their energy and enthusiasm. These include Arthur Neild, secretary-treasurer, and K. V. King, a director.

The road from chicken coop to international success has been no easy stroll for the men at Jennings. The company's founders haven't forgotten their earlier tribulations. In the face of World War II shortages they bought canned motor oil just to obtain the sheetmetal to build radically new condensers.

Jennings products are now being hurled into outer space as part of several different missile projects. And with new developments being conceived every month in the San Jose plant, the future of Jennings seems as broad as outer space itself.

Reactors a 'First'

(Continued from Page 6)

manufacturers in the world.

The giant pressure cooker is designed to cook and sterilize various food products in sealed containers —automatically and continuously.

Moving in and out of the plant at various times during the canning season are peach pitters, pear processors, tomato, and onion peelers and dozens of other specialized machines being refitted for use in the large food processing plants.

Canning Machinery Division is now engaged in manufacturing restaurant equipment, such as a utensil washer that scours pots and pans clean with a pressurized flood of hot water.

Virtually any type of food product that can be named is prepared, packed, processed or specially handled by one or more types of equipment turned out by the entire division.

Other facets of the giant FMC worldwide operation require additional reams of copy to relate. In the field of chemicals alone, FMC enters into the realm of household detergents, synthetic rubber for tires, rocket fuels, plastics and dozens of other industrial chemicals.

Jennings: Up and Coming

Giants of Santa Clara County's booming electronics industry elbowed over a little bit in the front ranks during 1958 to make room for a lusty San Jose youngster with proven talent.

Born into uniform during 1942's war days, Jennings Radio and Manufacturing Corp. won its share of military production honors then donned civilian clothes to make its mark in the Space Age's vital electronics field.

Last year saw Jennings starting production on its unusual line of equipment in a brand new, 40,000 square foot building at 970 McLaughlin Ave.

Today, the company is housed in a total of 88,000 square feet of floor space, employs 300 skilled workers and is busy revolutionizing the techniques of power switching.

Progress at Jennings during 1958, according to Calvin K. Townsend, vice president and general manager, meant a $750,000 investment in the future and a 20 per cent increase in growth

After doubling the size of the plant last year, Townsend said the firm is confident it can expect another 20 per cent growth increase during 1959.

Like others in electronics, Jennings puts a heavy emphasis on research in an effort to do its darndest to make its own products obsolete. In other words, keeping up the search for the fabled "better mouse traps."

Better Mouse Trap

Jennings is betting heavy on its better mouse trap, a tiny giant of a vacuum switch only eight inches long and a few pounds in weight that does the work of massive oil circuit breakers.

A single Jennings vacuum switch, for instance, can handle the electrical load used by the Greater San Jose area during a 24 hour period—an estimated 140,000 kilowatts installed load on a 12 KV system.

Any one of five types of Jennings vacuum switches can handle this load.

First developed in the Cal Poly laboratories, the vacuum switch was perfected and produced by Jennings until today there are more than 100 varied uses.

The excellence of the vacuum switch made here in San Jose has been proven with reports that German and other European manufacturers have tried to duplicate the Jennings switch and have given up.

To give its equipment a beating it will never encounter in actual field conditions, Jennings has built the largest high voltage testing laboratory west of Philadelphia.

A large building, painted a dull black on the interior, houses one of the largest electrical substations in the San Jose area.

The facility can deliver up to 2,000,000 volts of instantaneous power. "Fired" in a matter of micro-seconds, the crackling arc sounds like a heavy caliber revolver going off in a sealed room.

Jennings' new production building is a maze of overhead pipe work where numerous types of gases are fed into various machine stations on the spacious floor.

Own Glass Works

The firm does its own glass forming work, fusing vacuum tubes together with the use of an assortment of gases including hydrogen, oxygen, propane and natural gas.

Each tube goes through a chemical washing department that removes every trace of dirt that would create an arc and ruin the vacuum.

After the wash, the tubes are finally sealed after the required vacuum effect is achieved.

Some 20 to 30 new products are researched, engineered and developed at the Jennings plant in a year's time.

Although the vacuum tube is the mainstay, the firm also turns out such electrical equipment as high power linear amplifiers, fixed and variable capacitors, insulators, kilovoltmeters, probes, relays and numerous other items.

Jennings, stuck with large inventories of raw materials after its early years of war production, has never had to call on the government to get it "off the hook."

Instead, it went out and built up a civilian market for its unique line of materials.

The San Jose outfit does not go out and seek military and research projects as a subsidy, thus, in effect, "selling" a portion of its plant to the government.

Competitive

Instead, Jennings engineers and technicians are willing to tackle a problem for the military, find the solution and ways and means of producing it, then offer to produce it in competition with the industry.

The policy obviously finds favor with the military, judging from the considerable amount of Army Signal Corps work being done at the plant these days, as well as other branches of the service.

Jennings, too, is looking far into the Space Age with plans being worked out to reduce the size of their equipment even more to meet the Space Age problems encountered by rockets and missiles.

The firm has leadership of the type that can look ahead. Vice-President Townsend, no less than 13 years ago in 1945, commented:



UNVEILING — George Joki (left) and Charles M. Rice of American-

"We are optimistic enough to believe that the San Jose area will become the center of the electronic industry on the West Coast after the war."

Two years ago, Townsend held the presidency of the West Coast Electronic Manufacturers Association and today is a member of its board of directors.

Jennings, too, moved over a little bit to make room for the nation's top electronic concerns, all within a short distance of the growing firm.

Ames Lab.-- Out in Space

A change in names, nothing to be excited about un-

(Continued on Page 8)

San Jose Mercury-News Jan. 25, 1959

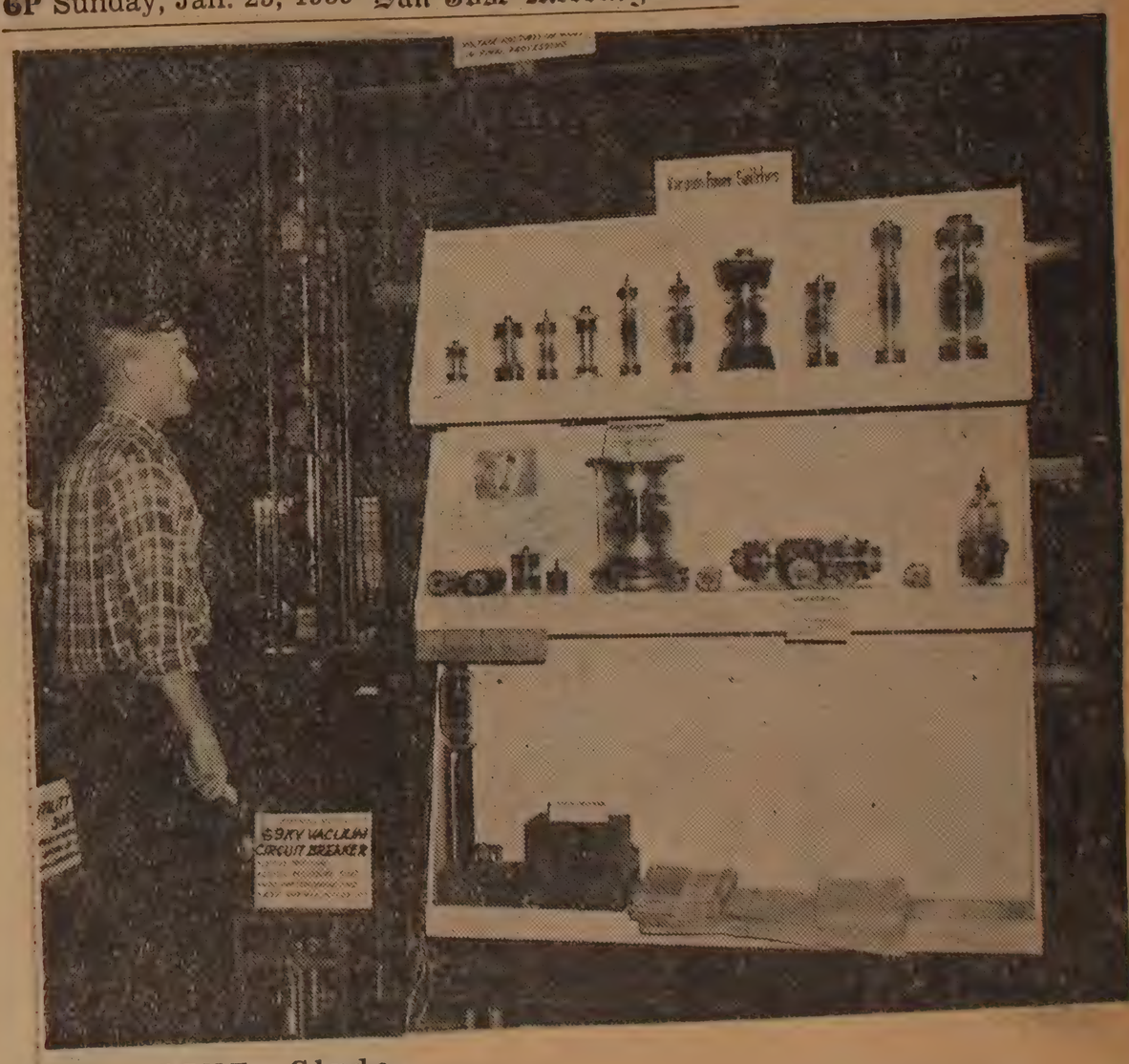
Industries in the Santa Clara Valley.

(See photos on reverse---



ON SHOW FOR TEACHERS — Some 50 San Jose area industrial plants are planning informative program for visiting San Jose teachers tomorrow in Business-Education Day. Pre-viewing some products of interest and educational value in Jennings Radio Manufacturing Co. are, left to right, Halsey C. Burke, Chamber of Commerce president; Culver J. Kennedy, CofC education committee chairman; Lawrence A. Appleton, Board of Education president, and Robert E. Johnston, Jennings sales engineer.

See article on reverse---



FULL LINE—Clyde Woehrman of Jennings Electric Co. examines firm's complete line of vacuum power switches manufactured here. The company's famed vacuum circuit breaker is shown in background.

IT&T Takes Over Jennings Radio In Stock Deal; No Management Changes

Merger of Jennings Radio Manufacturing Co., founded here in 1942, and International Telephone & Telegraph Co. was revealed today.

Terms of IT&T's acquisition of Jennings common stock, largely held by Calvin K. Townsend, chairman of the board, and Jo Emmett Jennings, president and founder, were not revealed.

The transaction was described as an $8,000,000 deal by some, however.

In the formal announcement of H. S. Geneen, president of IT&T, Townsend and Jennings, they said merger agreement details provide that Townsend and Jennings are to exchange their controlling interest common stock for a proposed new issue of IT&T preferred stock at an undisclosed price.

Directors of both firms have approved the merger.

The agreement calls for Jennings Radio to become a fully autonomous subsidiary of IT&T with no change in management or operations.

Jennings Radio is known the world over for its vacuum switches used in transmission of very high voltages, and vacuum capacitors used in a wide range of commercial, military and missile applications.

Jennings Radio, with its main plant here at 970 McLaughlin Ave., employs about 450 persons. It currently is building a plant in Moss Landing for development of vacuum switches and manufacturing.

Geneen said, in part:

"Acquisition of the company represents an important position in an electronic component area which is the key to development by IT&T of a whole new field of products both in the United States and abroad.

"Acquisition of Jennings will broaden and strengthen our position as a manufacturer for and supplier to the electrical and electronic industries, public utilities, the communications industry, military services, space activities and the atomic energy field," he pointed out.

Feb. 8, 1961

I. T. T. Plans Stock Deal For Jennings

International Telephone & Telegraph Corp. said yesterday it will acquire Jennings Radio Manufacturing Corp., of San Jose, Calif., developer and manufacturer of high-power vacuum capacitors and switches.

Although the purchase price is not disclosed, the agreement calls for exchanging I. T. T. stock for the assets of Jennings.

I. T. T. said the acquisition will broaden its position as a supplier to such fields as the electrical and electronic industries, as well as public utilities space activities and the atomic energy field.

International Tel. To Buy Jennings Radio, San Jose

A joint announcement today disclosed that International Telephone & Telegraph Corp., New York, will acquire Jennings Radio Manufacturing Co., San Jose.

The San Jose firm, organized in 1942 and privately owned, produces high-power vacuum capacitators and switches.

Calvin K. Townsend is chairman and J. E. Jennings, president. The purchase price was not disclosed.

International Telephone already operates multiplexing and communications laboratories in Palo Alto.

IT&T to Acquire San Jose Firm

International Telephone and Telegraph Corp. has agreed to ecquire the Jennings Radio Manufacturing Corp. of San Jose in an exchange of ITT stock for Jennings assets. The value of Jennings, developer and manufacturer of high-power vacuum capacitors and switches, was not disclosed.

For eight years th... Jennings C...

International Telephone & Telegraph Corporation

has acquired the assets of

Jennings Radio Manufacturing Corporation

San Jose, California

The undersigned assisted in the negotiation of this transaction.

LAZARD FRÈRES & Co.

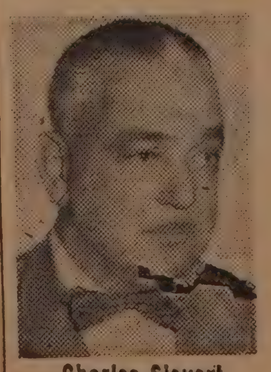
July 6, 1961.

San Francisco Chronicle

By Charles M. Sievert

Geneen's No. 1 Target: A Money-Making ITT

Men and memos: One great change has taken place in the life of Harold S. Geneen since he took over as president of International Telephone & Telegraph Corp. 19 months ago: He's become a world traveller. Nor was this inspired by the chromatic literature of Thos. Cook & Son. ITT has 35 divisions with 116 plants sprinkled over the globe and when he moved into the headman's chair it became imperative, in his scheme of things, to see just how the properties were operated.



Charles Sievert

He's glad he did it, too. Other night at dinner he was telling of his arrival in Australia where he believes the IT&T division has a promising future. "Nobody there had ever seen or heard from an ITT president," he recalled. To put it in the idiom, they were surprised that the home office cared.

* * *

In Europe, his eyes opened wide when he saw the assorted manufactured products, mostly electronic and electrical, turned out in plants in Germany, France, Belgium and Sweden.

He made one observation: While they were content with their operation and what they were doing, they paid no attention to competition nor were they progressive in new product development.

For instance, in Germany they make the motor for an electric shaver, but they never thought of producing the entire shaver—a product believed to have a good potential on the Continent.

* * *

However, those who know the Geneen career from Wall Street to American Can to Jones & Laughlin Steel to Bell & Howell to Raytheon, also know there has been no change in another of his very telling qualities: An inquisitive eye for the profit column.

He has certainly cleaned house, as the expression goes, in his 19 months. He's fired and hired, he's closed up some operations and expanded others. He looks at the invested dollar and with his sharp accountant mind can spot a weakness where the return is under par.

ITT folks know this now, but they also know that the octopus-like operation is growing healthier financially and competitively. His outlook is that volume, near $800 million for last year, will double in the next five years—and you can almost bet that earnings will be handsome, matching the growth.

* * *

While his associates look upon him as an indefatigable worker, thinking nothing of 14 hours a day on the job, he feels he was only doing what was required to get ITT into the shape he's patterned for it.



H. S. Geneen

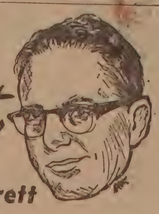
When he's got the machine lubricated and running to his liking, you'll see more of a relaxed Geneen look in the paneled Broad St. office where the late Sosthenes Behn sowed the seed for his empire

With its laboratories digging into new sources of energy, such as atomic, and probing weather and space, ITT isn't headed down a dead-end street. One of its defense contracts calls for a $300 million complex nerve center for SAC's war room. Nothing trivial, to be sure.

The company is strong in technical skills and research; now the new Geneen management has streamlined it to win the profit race.

New York World-Telegram & Sun
Feb. 8, 1961.

Share it with Barrett



By Dick Barrett

Wet Boat On Dry Land

The truck pulled up to the Jennings Radio plant on McLaughlin avenue and unloaded a grey, 30-foot boat. Jo Emmett Jennings, who has given his name, his considerable talents and some of the best years of his life to the company, greeted it with anticipation.

Jo, a top hand in the do-it-yourself field, had intended to convert it into a cabin cruiser, but it wasn't quite as he had imagined it when he saw it listed among Navy surplus. For one thing, it was intended to accommodate 100 shipwrecked sailors, and for another it was intended to be powered by 12 men pulling on oar-like levers that turned a propeller.

John Phillips of the high voltage lab took one look and remarked that he had once owned such a craft in the Midwest, where he sailed it on Lake Huron, and that it had been a beast for rolling, even after he had welded some hot-water tanks to the sides to stabilize it.

Faced with such considerations and the fact that he could not very well ask a dozen of his associates to serve as galley slaves on weekend voyages, Jo abandoned the idea of turning it into a cabin cruiser.

Well, what do you do with a broad-beamed 30-foot row boat once you have given it up as means of navigation?

Jo has a restless mind that never turns down such a challenge, and everyone who knows him knew he would find a use for the craft.

Now it so happens that Jennings Radio, in producing vacuum capacitors and vacuum switches, uses tremendous amounts of electrical energy for test purposes—heavy currents and extremely high voltages. The power has to have some place to go, and if it is not put to useful work it has to be dissipated. Jo solved the double problem of how to use the boat and get rid of this power all at the same time.

He reasoned that if the boat would keep w[illegible] out it would also keep it in, so he had it mo[illegible] on a steel frame, filled it up and introduce[illegible] large electrodes. He also attached a hose and a pump to keep the water circulating. (The electrical resistance of the water varies with temperature.) Now when certain types of testing are under way the surplus power comes to the end of the road as heat radiated away in circulating water. (Once, when someone forgot to turn on the pump, the heat was so great that a section of plastic pipe under the boat blew up.)

Visitors to the plant today are sometimes startled to see water in a boat instead of a boat in water.

* * *

Jo's ingenuity, left free reign with his uncle, Calvin Townsend, handling business matters, has kept the company on the path of solid growth. It began with Jo's interest in ham radio and high power. He developed the vacuum capacitor as his initial product, and it is still the company's main bread and butter item, but the day may not be far away when in it will be supplanted in importance in the company's life by the vacuum switch which has an expanding market among r[illegible] utilities and other large users. There are n[illegible] people on the Jennings payroll.

Joe has managed to combine his ham ra[illegible] hobby with his work. When a component is developed in the 1000-watt range, the maximum amount of power allowed the amateurs but small by Jennings standards, he incorporates it into a portable transmitter and tests it on cross-country trips to electronics shows or on vacation junkets. In doing this he has made some notable achievements in miniaturizing high power amateur apparatus. One of his one-kilowatt transmitters is enclosed in the piece of plastic tubing on which its whip antenna is mounted. Road testing shows how new components will operate under varying air pressures, temperatures and degrees of moisture and vibration. If one fails it is returned to the shop for re-study.

For many electronic companies it would be bad news if it suddenly became evident that we were to live in a world of lasting peace, so heavily do they rely on defense work. Jennings has maintained a good balance between civil and military work and has no direct government contracts, preferring to maintain its independence and retain ownership of any discoveries that come out of Jo's restless brain. Nevertheless, it can be said that every American missile that heads for outer space probably has a Jennings capacitor or switch aboard, for they have almost an infinity of applications in our electrical and electronic age.

Remember When?

George Joseph (Joe) Boyarsky, 435 Autumn Court, who will be 65 Wednesday, wonders if anyone is still around who was in the Garden Theater on West San Fernando street at San Pedro in 1903 when it was shaken by an earthquake.

Joe was a kid in uniform and little red cap tending the door and acting as usher—at the age of 9—for A. M. McCabe, father of Jay McCabe, the local celebrity. He remembers that "Quo Vadis" was playing on the stage of the Garden when the temblor hit. It came after he had everyone seated.

One person who was present was Al Liebenthal, now a night watchman for the Chase Lumber Co. He remembers the occasion. Mr. Boyarsky wonders if there are any others.

Jay recalls that the theater got another good shaking in 1903. It stood until 1916 when it was destroyed by fire. Jay was promoting wrestling matches in it at the time and had sent a wrestler named Nick Daviscort to the basement to look for something. He dropped a match he was using for illuminating and the place was destroyed.

Jennings of San Jose

Busy Firm Hatched in Chicken Coop



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Almost a native son, Jennings, now 48, was brought to San Jose from Council Bluffs, Iowa, by his family as an infant. During undergraduate days at San Jose State College his major was music. But gradually his minor—electronics—



FOUNDERS OF JENNINGS Radio Mfg. Co., of San Jose, contrast two of the company's products. Jo Emmett Jennings, left, and Calvin Townsend, display a huge vacuum variable capacitor of 50,000 volts rating and a new sub-miniature model.

began to attract more of his interest. After graduate work in science at the University of California he joined Eitel-McCullough, Inc., and was employed at its San Bruno plant for four years.

With endless new ideas buzzing in his active brain Jennings decided to go into business for himself. In one of those twists of fate which occur every so often in industry the paths of Jennings and Townsend crossed. They have made an excellent team. Older of the two by 10 years, Townsend handles sales and production. His snow-white hair is cut crewcut style and his alert eyes reflect the energy that has been so much a part of company growth.

Because the company operates in highly specialized fields, it operates no distributorships. Money saved through streamlined sales operations is ploughed back into the business.

Two other factors have contributed greatly to success. Everything the company produces is original and most of the products center around vacuum techniques developed by Jennings. Large American companies have spent more than $1,500,000 unsuccessfully attempting to develop a vacuum condenser. Jennings did it and with far less.

The vacuum switches designed and made by Jennings represent a radical departure from conventional switching methods.

Jennings, who is president and director of research, and Townsend, executive vice president and chairman of the board, have surrounded themselves with a number of other executives who match their energy and enthusiasm. These include Arthur Neild, secretary-treasurer, and K. V. King, a director.

The road from chicken coop to international success has been no easy stroll for the men at Jennings. The company's founders haven't forgotten their earlier tribulations. In the face of World War II shortages they bought canned motor oil just to obtain the sheetmetal to build radically new condensers.

Jennings products are now being hurled into outer space as part of several different missile projects. And with new developments being conceived every month in the San Jose plant, the future of Jennings seems as broad as outer space itself.

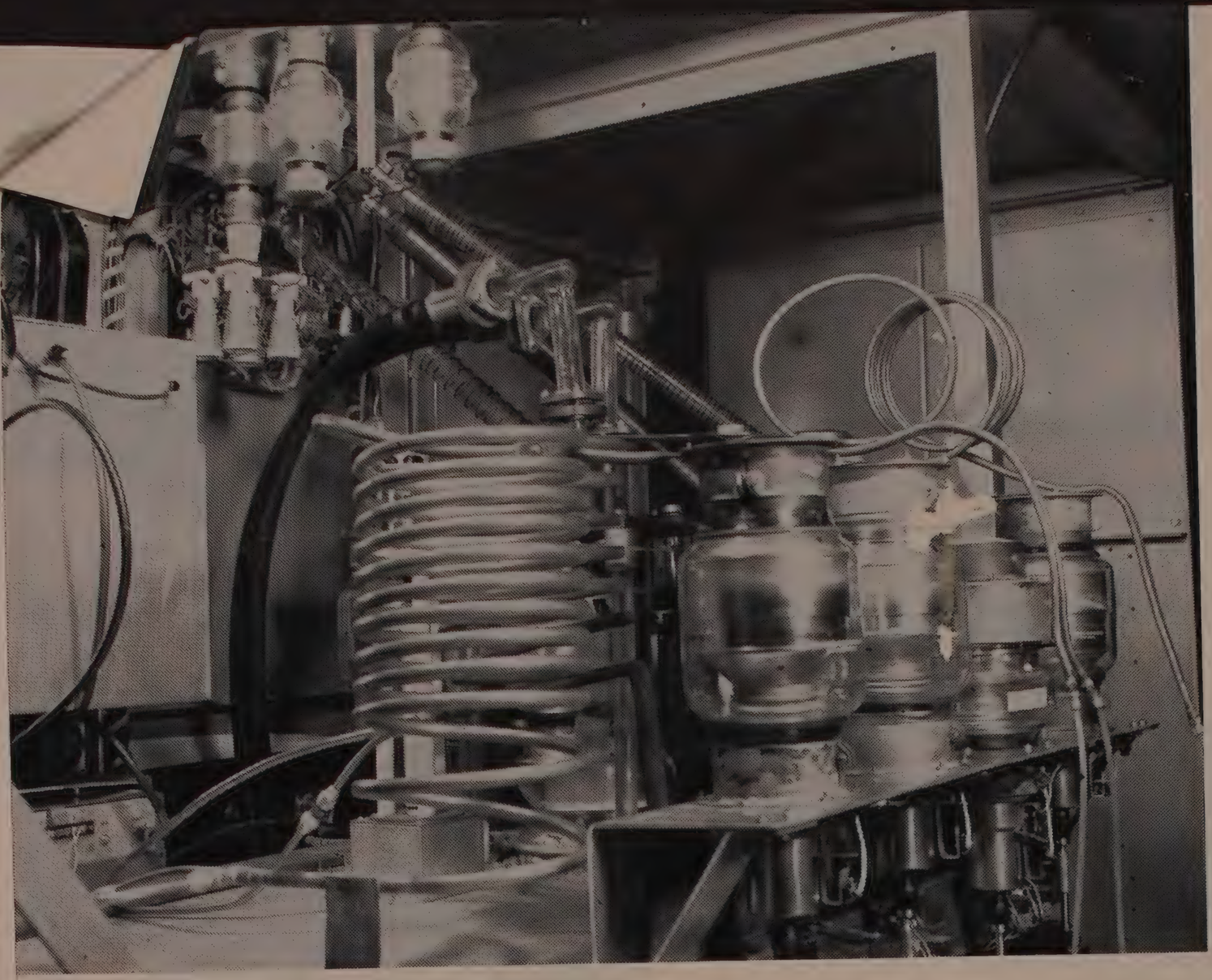


Fig. 1: Final amplifier plate circuits and r-f chokes utilizing motor operated vacuum variable capacitors are shown.

By JO EMMETT JENNINGS
President
Jennings Radio Mfg. Corp.
P. O. Box 1278
970 McLaughlin Ave.
San Jose 8, Calif.

100 KW Transmitter

THE trend in transmitter design has been to employ a combination of inductance and capacitance change to produce the desired frequency. When decreasing inductance it was necessary to physically remove the coil and replace it with one having less inductance, or to short-out the unused portion. The slider system has a high degree of flexibility but there are the disadvantages of physical size as well as contact erosion due to prolonged operation on one frequency. Mechanical linkages or servo operation only ease the physical labor. They have not removed the problems of frequency shift in the transmitter. With the application of vacuum capacitors in tank circuits, wide minimum to maximum capacity shifts are practical, thereby reducing one of the problems in frequency shifting.

The R-F Testing Lab at Jennings Radio Mfg. Corp. is continuously testing vacuum capacitors and vacuum switches to produce realistic data by operating a group of each type of capacitors and switches. Beginning in the 2 to 3 MC range, and going up to 20 or 30 MC., measurements of voltage, current, frequency, and temperature are made. Repetitive testing calls for readjustment in frequency as well as the output circuits for each test. A program of this nature requires almost as much time for set-up as is for testing. Recognizing the mounting labor costs, it was decided to embark on a program of frequency changing from a new concept.

At the outset of this program it was deemed advisable to produce experimental models in the 1 to 2½ kw range. True, the 2½ kw amplifier presented no voltage or current problem, yet there were certain design factors which must be ideal to insure stable operation. A tuned tank circuit for each band was the first step in producing a multi-band amplifier.

To assure success of the new system, several different models were fabricated and put into operation to begin the evaluation process of components, efficiency and adaptability. It was determined early, and verified continuously, that vacuum capacitors and vacuum switches were important in the design of an efficient band switching amplifier.

A prime consideration in setting up an amplifier from 2 to 30 MC. was the h-f resonance in unused tank circuits. The effect of the contact capacity, resistance and inductance in the group of switches, plus the problem of distributing the r-f energy from the particular tank circuit to a load were examined. All of these factors caused us to evaluate single pole vs. multiple pole vacuum switches for long life and stable operation. Needless to say, various models went through an evaluation program and have finally been crystallized in the

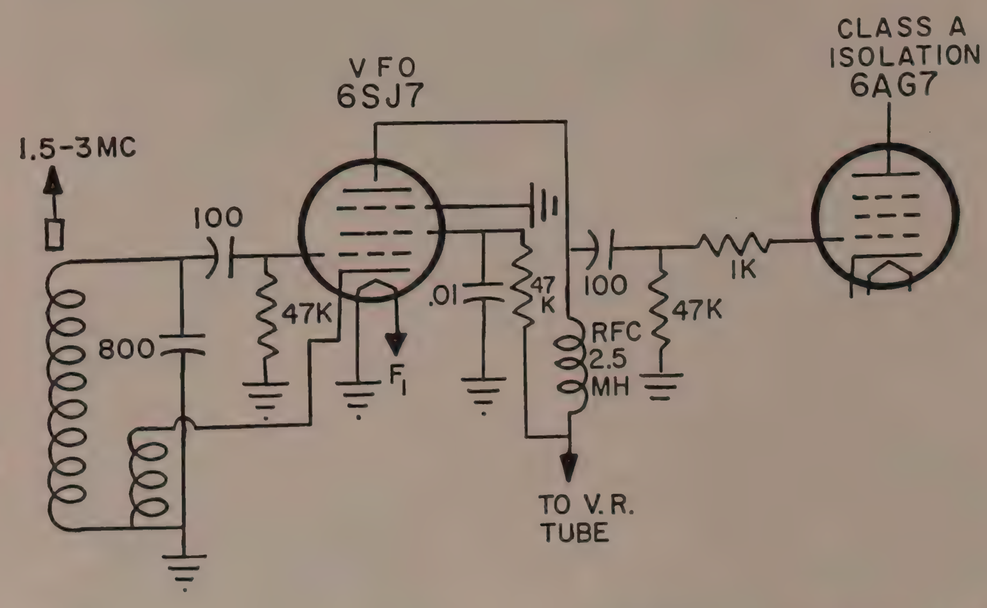
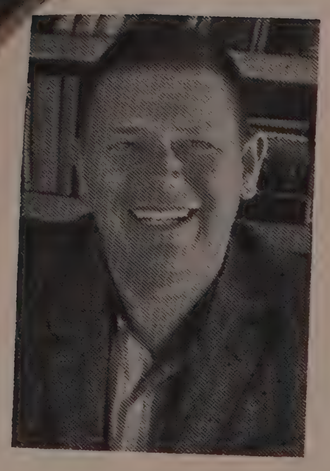


Fig. 2: A stable VFO was chosen instead of a crystal control oscillator because of the need for many different operating frequencies.



J. E. JENNINGS

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The Editor
ELECTRONIC INDUSTRIES
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The new design ideas used in this h-f wide-range transmitter are unique. They can be incorporated in other transmitter designs. Accurate, stable switching is obtained by using vacuum relays and vacuum capacitors in the tank circuits. Over a wide frequency range, r-f chokes can be a problem. A fresh approach to this problem is clearly described.

Has New Design Ideas

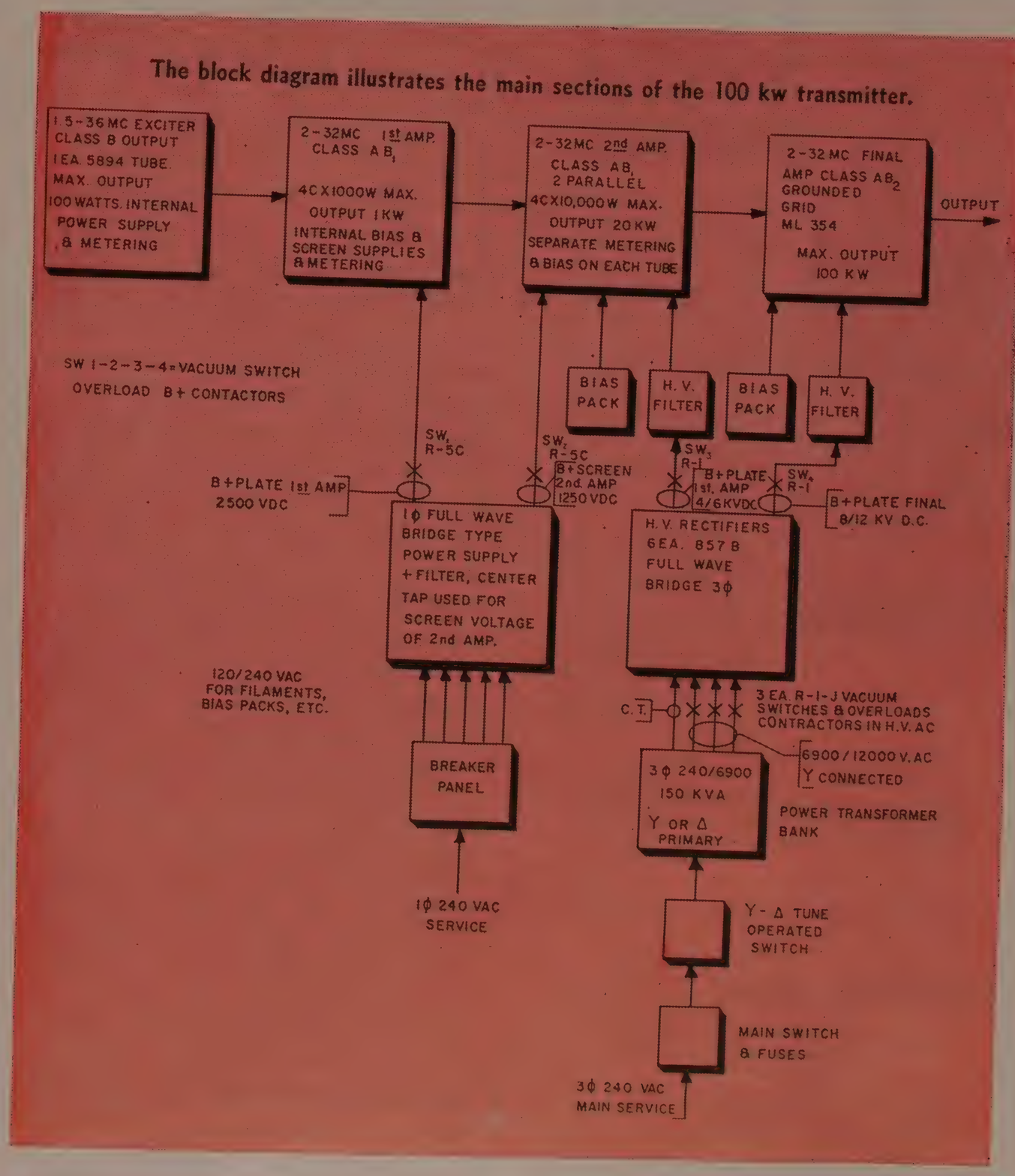
transmitter to be described. The model is now in daily use.

The first and most important part of any transmitter is the signal generator. We chose a stable oscillator (Fig. 2) in preference to a crystal frequency generator since frequency changes in our particular operation were necessary. From the signal generator the harmonic frequencies are produced by a series of frequency doublers, the output of which is switched into tuned input circuits to the first buffer stage, which is followed by the 5-band, 1 kw amplifier operated in Class AB.

First Power Amplifier

As can be seen in (Fig. 3), pi net circuits were employed to match the plate impedance of the buffer to the grid impedance of the first power amplifier. We used a Model RB3 dpdt vacuum switch for each tank circuit (Fig. 4), the solenoids of which are energized from the master band switch. All of the solenoid relays are operated at 24 vdc. to eliminate hum, shock, and simplify wiring. The input of the first power amplifier incorporates a circuit with tetrode power tubes. By resistive loading the in-

The block diagram illustrates the main sections of the 100 kw transmitter.



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Transmitter Design *(Continued)*

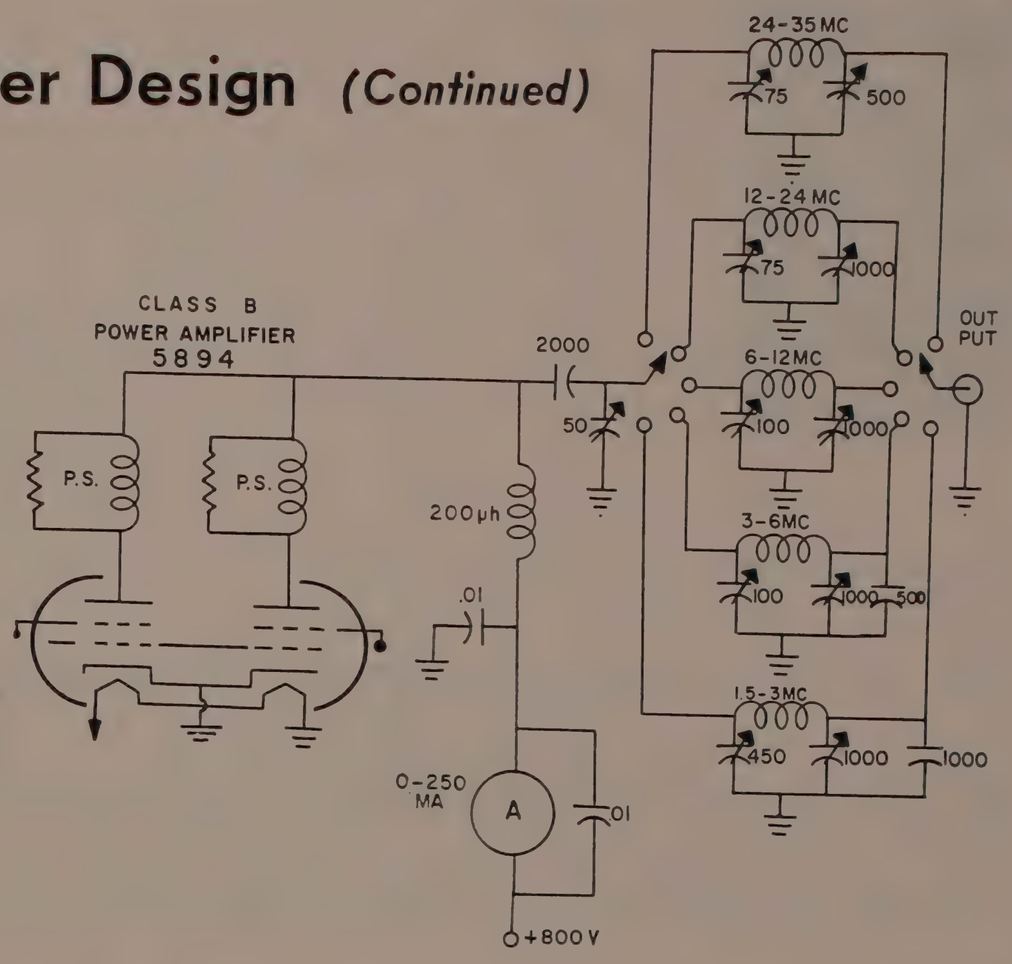


Fig. 3: Pi networks were used to match buffer output to grid of first P.A.

put circuit and dissipating a given amount of energy, we simultaneously reflect a low impedance at the grid itself. This assures stable operation and reduces the tendency towards non-linearity should we use this for AM or SSB linear amplifier service.

The output of the 1 kw amplifier tube is fed into a group of dpdt vacuum switches. One section switches the plate from the tube to the tank circuit. The other section switches the output from the tank circuit to the next power amplifier grid. When not in operation all tank circuits are grounded as well as isolated from the operating circuit. The low contact resistance and low inductance of a vacuum switch, combined with its small space requirements, make it ideal for this application. As can be seen in (Fig. 4), a pi net output is not employed since conductive coupling gives very good results. A pi net could have been used, but this circuit was found to perform satisfactorily without the additional components.

Resistance stabilization of the grid proved highly desirable for the 4CX10,000W tubes as no neutralization was necessary. When operating the second P.A., much thought was given to r-f potentials and the type of switches capable of handling the tank current as well as r-f voltage. Successful operation was attained with an R5C spst vacuum switch actuated by its accompanying insulated solenoid. Provision for metering the screen current of each tube, plus a vacuum circuit breaker gave ample protection for the screens. Normally a failure of plate potential without interrupting the screen potential would damage the tube, so the application of this miniature vacuum overload in the screen circuit was a necessary protection.

A fresh approach to r-f chokes can be seen in the plate of the 20 kw P. A. (Fig. 5). A group of r-f chokes are connected in series for each tube, accompanied by vacuum switches which short-out unused portions. The reason for this is quite obvious since a 30 MC r-f choke is completely inadequate on 2 MC, and a 2 MC r-f choke operating on 30 MC results in internal resonances. By shorting out portions of the choke as the frequency is increased, undesirable resonances are eliminated in a very simple manner. The output from the second amplifier, as switched by the series of R5C vacuum relays is used to excite a Machlett 354 power amplifier.

The 100 kw final stage operates in a conventional grounded grid configuration. As to the method of coupling, we were fortunate in having high current, high capacity, low inductance, fixed capacitors to by-pass the grid. For a high frequency operation, low capacity ceramics were mounted radially (Fig. 6) from grid to ground in a configuration resembling the

spokes of a wheel. Connected in parallel were four .002 μf vacuum capacitors for operation on the lower frequencies. Also two .002 μf capacitors of the same type were used to couple the r-f from the coax to the filament of the 354.

Switching final tank circuits with Type R1 vacuum relays proved to be a good choice as the potentials of 10 to 13 kv dc on the plate give parallel r-f potentials on the switches and vacuum capacitors. See Fig. 7.

For operation on the lower frequencies the residual capacity of the tube did not present a problem. From 20 to 30 MC the residual capacity presented a "Q" problem. It was solved by using a series resonant circuit. The output load was approximately 50 ohm and conductive coupling was used, although a pi net could have been incorporated in the design. A bank of five RC10's, 3⅛ in. coax vacuum switches were used to couple each output circuit to the load termination.

As the schematic shows we have built up a different arrangement of the r-f choke assembly in the final. Perhaps other systems could have been equally effective, but this method is practically fool-proof. Any radio frequency choke can be selected by the vacuum switch assembly. Proper indexing of these switches is accomplished by the master switch on the control panel. Actually, three solenoid type chokes were connected in series with vacuum switches which could short-out progressively as the frequency is increased. To further protect the final amplifier tube, a vacuum overload has been incorporated to interrupt high voltage fault current in about 10 msec. Since all of the amplifiers are operating in the AB region, excellent harmonic suppression is achieved. An oscilloscope monitors the signals at all times, displaying a sine wave. This is essential for establishing calculated current ratings compared to laboratory results.

Water cooling was necessary in the 20 kw driver tank circuit and the tank coils of the final amplifier. Actually, liquid cooling of the coils is accomplished in a unique fashion. The correct O.D. of straight tubing is selected for the current

ESTIMATED CURRENT FLOW IN SWITCHING RELAYS

Band		Amps
No. 1	2 - 3.5 MC	17½
No. 2	3.5- 6 MC	28
No. 3	6 -10 MC	56
No. 4	10 -18 MC	93
No. 5	18 -32 MC	150

Allowable frequency shift:

Without retuning when circuit is loaded 100 KC:

±50 KC unloaded:

Loaded band No. 1	±100 KC
No. 2	±150 KC
No. 3	±200 KC
No. 4	±300 KC
No. 5	±400 KC

R-F CHOKE ARRANGEMENT

Band 1 & 2—2 to 3.5 MC—1st RFC; 3.5 to 6 MC

Band 3-4—6 to 10 MC—2nd RFC; 10 to 18 MC

Band 5—18 to 32 MC—3rd RFC

2 to 6 MC 14 turns per in.—27 in. long.

6 to 18 MC 3 turns per in.—27 in. long.

18 to 32 MC 1 turn per in.—27 in. long.

1½ in. dia. for high frequency.

2 in. dia. for low frequency.

All wound on hard glass tubing.

Fig. 4: Vacuum switches were used in the output of first P.A.

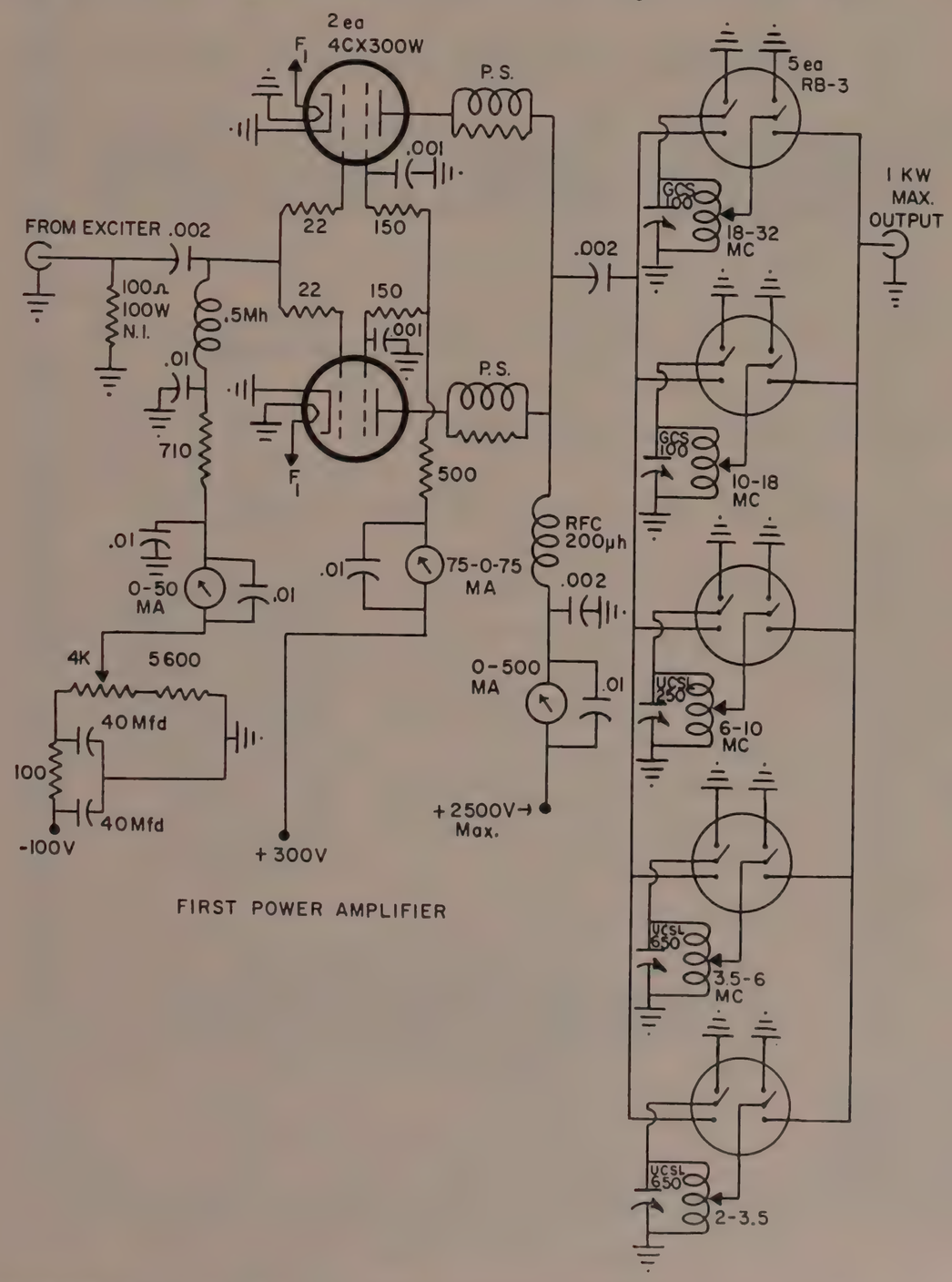
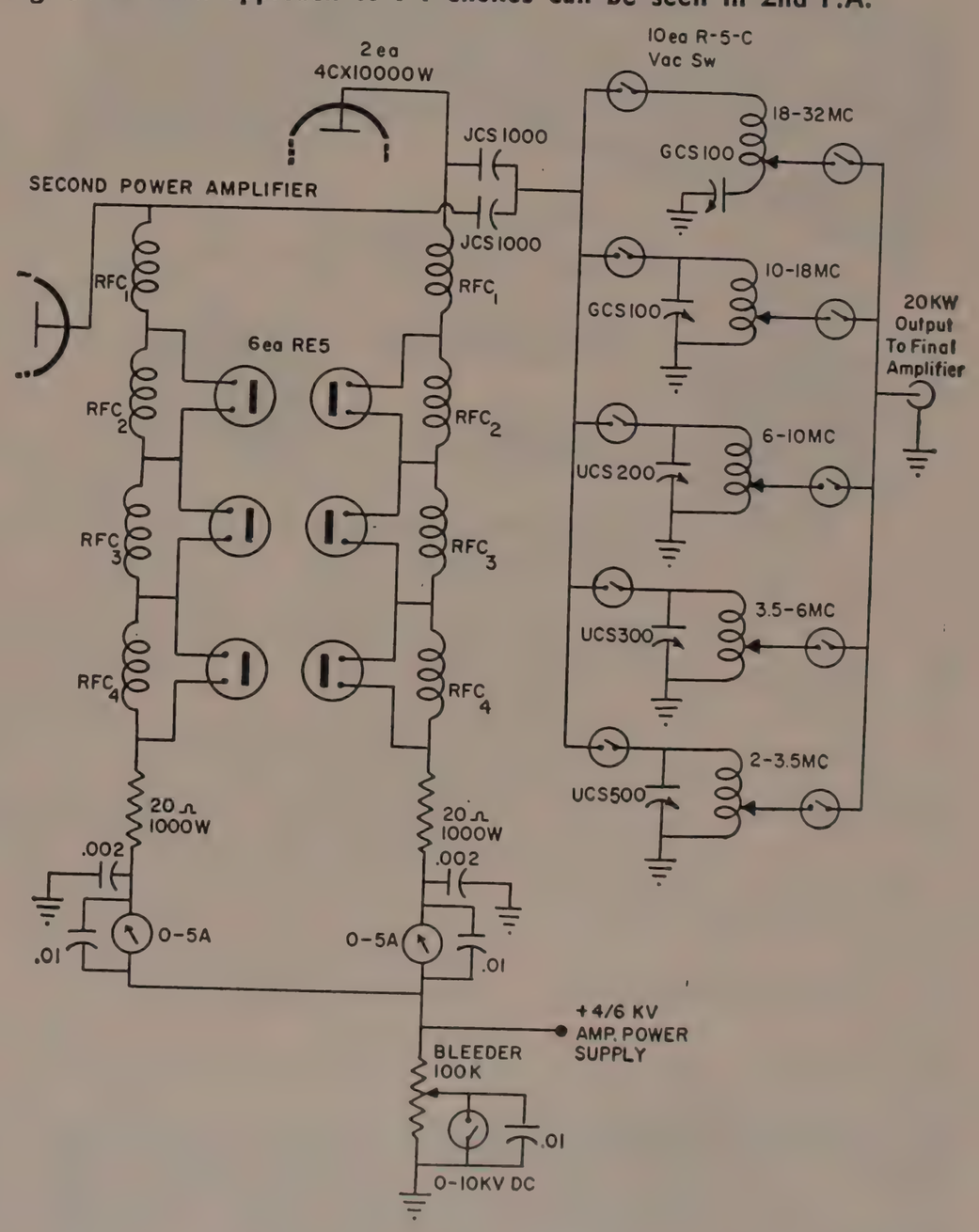


Fig. 5: A fresh approach to r-f chokes can be seen in 2nd P.A.



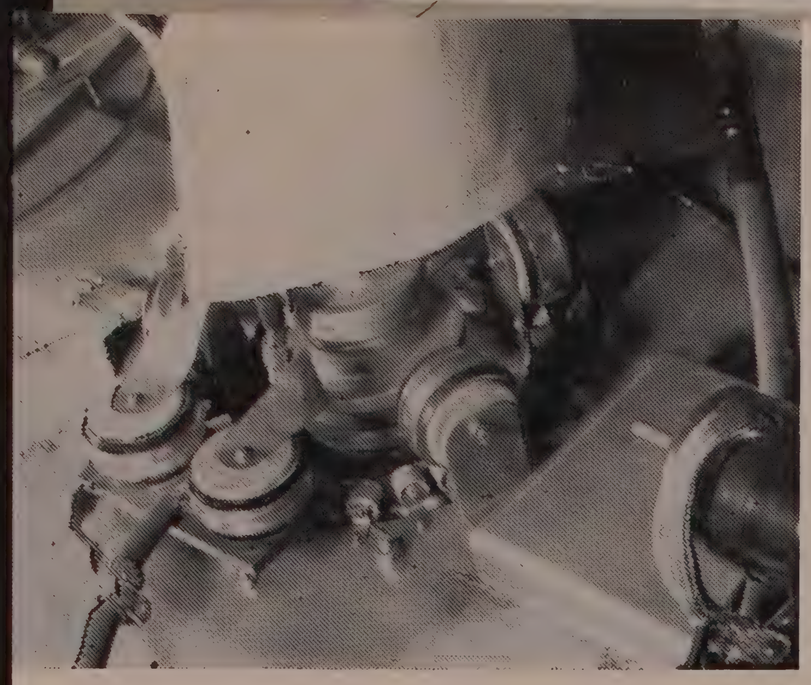


Fig. 6 (left): Final P.A. tube is shown with radially mounted ceramic capacitors. Cloth over tube is air duct.

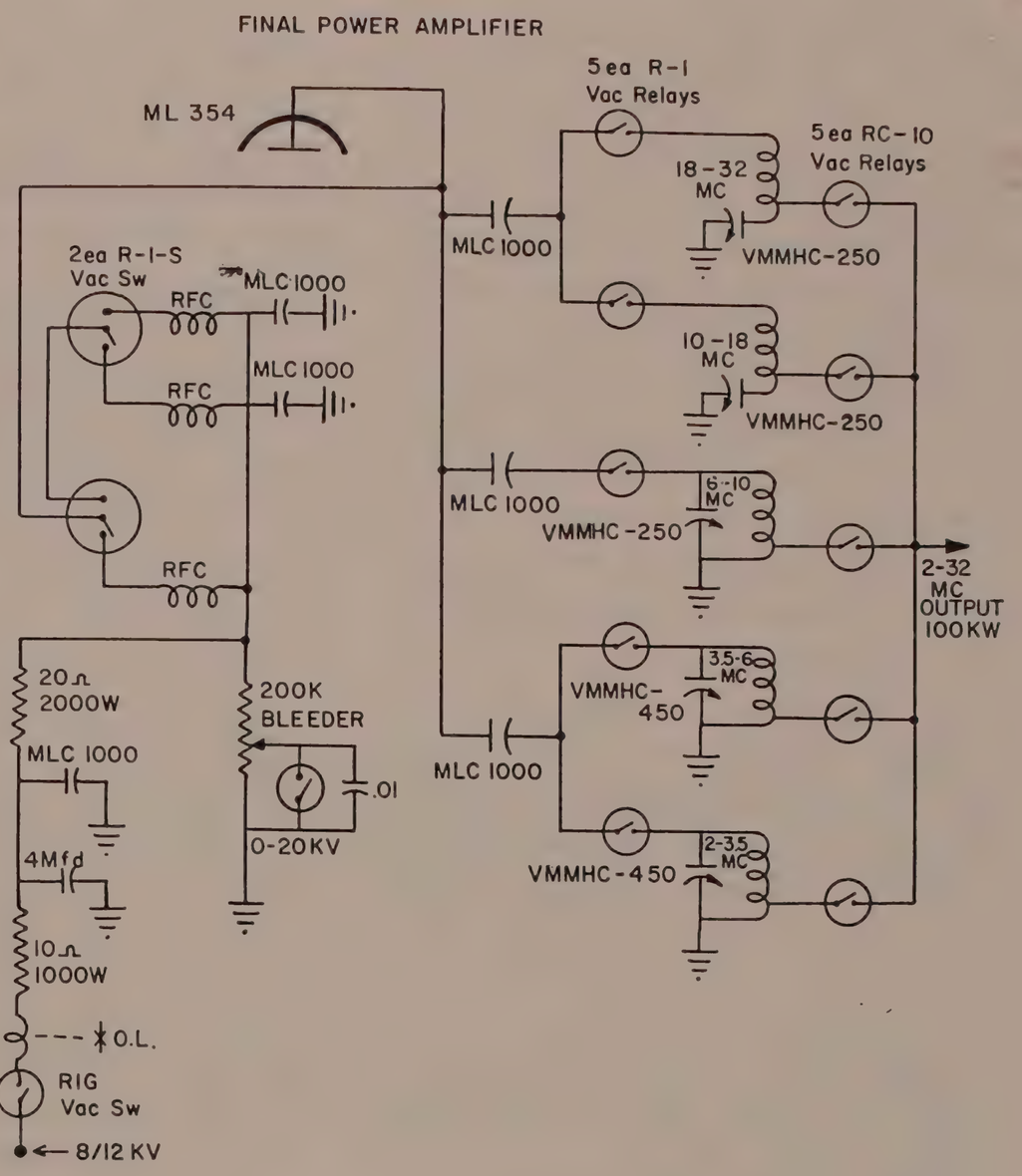


Fig. 7: Final tank circuits are switched into use by vacuum switches. Note r-f choke arrangement.

Transmitter Design

capability and correct inductance. A smaller diameter length of tubing is slipped inside of the larger copper conductor after which the coil is fabricated into a correct physical dimension. The water then flows through the tube and back through the other in a concentric fashion. Cooling water is supplied to the tank coils at r-f ground potential on the first three low frequency bands. When using series resonance on the two higher frequency bands, r-f isolation is part of the cooling system.

Normal operating conditions for the final amplifier tube are as follows: plateloading is 1666 ohms with a capacitive reactance. The highest frequency is 175 ohms and the lowest frequency is 300 ohms. This is for 3 kv dc at 8 amps. The loaded "Q" is approximately 5.

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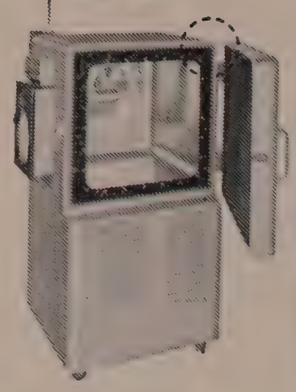
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Power Supply

The power supply to accompany the 100 kw transmitter is novel too. Many digressions from the custom construction are incorporated in the new design. A compact walk-in cubicle houses the power supplies and relay assemblies.

All units are adequately protected within themselves and designed for rapid operation and service. First, the power transformers for the high voltage are oil immersed, outdoor type and installed on an outdoor pad. The input is 240 volt 3-phase energized by a 3-wire conventional enclosed, fused, disconnect switch. Incorporated in the primary buss is a 3 pdt manually operated switch to change from Delta to Wye operation. When connected in Wye, operation is for low power or tune-up. The Delta connection is for operating under full power. The secondaries are connected in Wye and are brought into the power cabinet through conduit. Three vacuum circuit breakers are set to trip under overload or fault conditions to protect the electrical system.

As mentioned previously, a vacuum overload is incorporated in the dc 12 kv to interrupt the high voltage for the final amplifier. Another overload is used to interrupt the 6 kv of the 20 kw driver. With these fast operating vacuum dc circuit breakers, it is possible to drop a circuit before any serious difficulty could take place due to fault conditions.

As for the small supplies, they are of a conventional nature and further discussion of their function would be repetitious. Although the partial schematics do not show the complete wiring and monitoring circuits, we have remote reset buttons and indicater lights which show when a circuit is inoperative. This gives greater flexibility and pinpoints for the operator, the defective circuit. This type of power supply design is a radial departure from conventional methods because of the extensive use of vacuum overloads and contactors. Life tests have been conducted to guarantee long life under normal operation or for conditions up to a 500 per cent overload.

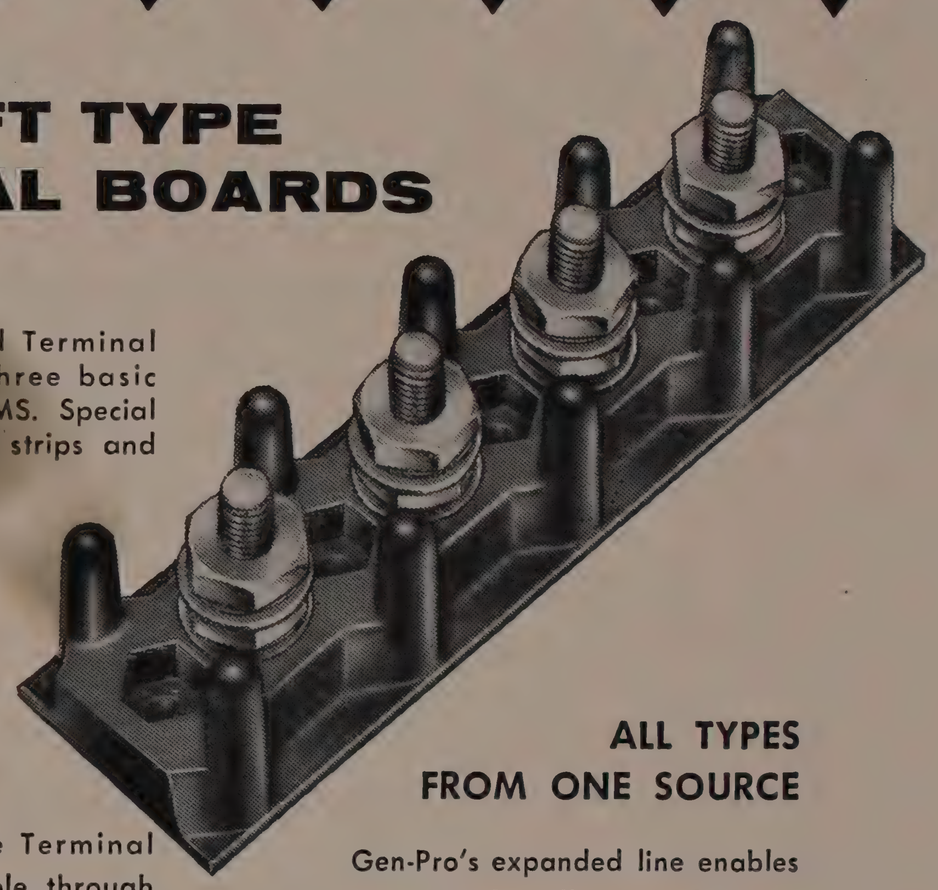
Conclusion

Due to the many experimental models previously designed and built before this final transmitter was started, we were able to produce a design that was generally considered impossible. All of the stages performed as designed without being debugged or converted for stable operation. In the entire transmitter, the only problems experienced were with r-f chokes. It took some time to work out the actual r-f choke values for optimum operation on all frequencies. No parasitics were encountered in any stage and the transmitter has been in operation since the original tune-up. All circuits were carefully checked with a grid dip meter prior to applying power, insuring excellent electrical characteristics. Any tank circuit can be shifted and operation established in case of electrical or mechanical failures.

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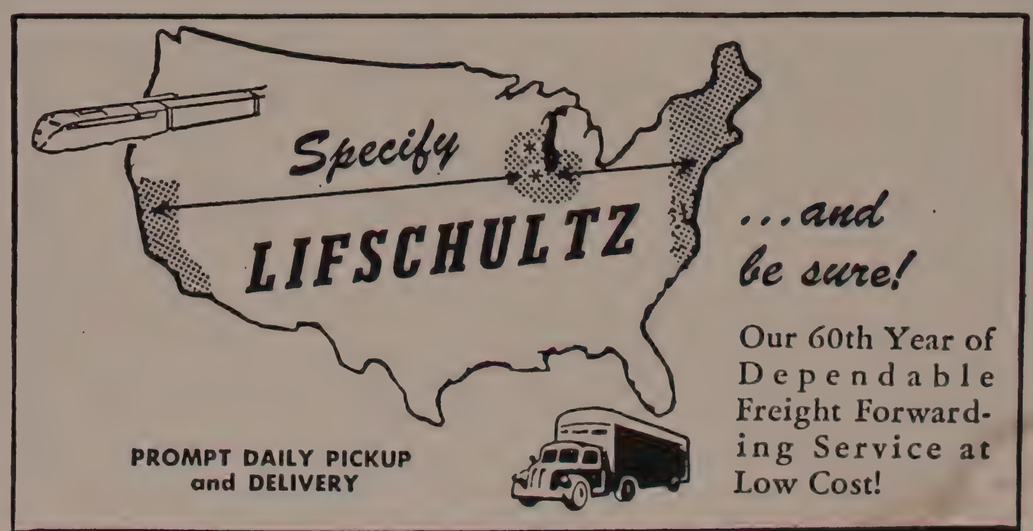
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APRIL, 1960 Vol. III, No. 4

THE SIDEBANDER



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W1NVB	Clarence	W4OPM	Joe
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W2ADB	Art	K5GUA	Al
W2AYU	Walt	K5HFI	Tom
W2BAK	Gene	W5QGD	Harvey
W2CLG	Llew	W5MMD	Tom
K2CV	Nort	K5QWZ	Bob
WA2DMW	Bill	W5SVP	Bill
W2DWH	Joe	K5VHI	Doc
WA2FBH	Dick	W5VPQ	George
W2FCE	Al	W6AET	Flo
W2FKF	Ed	W6AWW	Lloyd
K2FW	Jim	WA6CAK	Bill
W2FXN	Bob	W6DZQ	Henry
W2GB	George	W6ECC	Ernie
K2GCP	Les	K6FH	Ted
K2GI	Wally	W6YMV	Paul
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W2HQL	Joe	W7FJ/3	Bill
W2HXD	Rod	W7GCS	Frank
K2JXY	George	K8ALM	Erv
W2KBV	John	K8BLL	Al
W2LF	Gene	W8BMX	Carl
K2MII	Len	K8DKC	Irv
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W2ZHZ	Bill	W9EWC	Butch
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W3UHV	Dale	DL4SD	Lee
W4AIX	Smitty	KW4BQ	Ed
W4ANE	Cal	KZ5LC	Len
K4BG	Vern	YV5DZ	Oscar
K4BJ	Ray	ZS6NE	Alan
K4GAX	Frank	ZS6AQQ	Art
	ZS6KD	Empty	

We thought that last month's total of 60 new members was a record breaker, but this month we have a new high of 109 new members--proof positive that sidebanders want what the SSBARA has to offer. Thanks to all our members for their cooperation and confidence!

****

SIDEBAND DINNER



WILLARD, W3DQ, CAROLYN, W3GTC and HAROLD, W3EQZ



FRANK, W2AMJ, BOB, W7JXR, and RAY, W2LNP



JO, W6EI, and ILA, K6MHU

SIDEBAND DINNER DRAWS RECORD CROWD!

The Ninth Annual Single Sideband Dinner, held on March 22, drew a record-breaking crowd of SSBers to the Statler Hilton Hotel. It is estimated that over 2500 SSBers visited the exhibits and socialized with their fellow hams during the day and over 850 SSBers and their wives were guests at the Dinner at which Bill Leonard, W2SKE, and W. Walter Watts, Group Executive Vice President, RCA, were the principal speakers.

Speaking on the subject, "The Changing Shape of Electronics", Mr. Watts disclosed the function of tubes in the first stage of the Pioneer V, in ground performance at tracking and triggering stations,and in the transmitter which takes over at eight to ten million miles out. Mr. Watts also reported the latest details in the trend toward smallness of electronic components and end products, and paid tribute to the progress being made in transistors, kindred semi-conductors, and the micromodule condept of miniaturization.

Acting as Master of Ceremonies, Bill Leonard kept the program moving at a lively pace. With his usual facility, wit, and charm, Bill kept the group chuckling at his bon mots.

During the presentation of the prizes, Bill was joined on the rostrum by the beautiful and talented Claire Griswold Pollock, daughter of our famous, beloved "Butch", KØDWC . Every prizewinner who came up to get his prize was accompanied by several of his friends who did not come up to to admire the prize.

The three big prizewinners of the evening were Bob, W2LWK, who walked off with the Eldico 100-F exciter; Harry, W2TUK, who won the Gonset G-63 receiver; and Ray, W4BJ,who added the Hammarlund HQ170 to his Miami shack. More than 20 other hams made the trek to the prize table,astounded that here was one affair at which they finally won a prize.

As you all probably realize, a tremendous amount of preparation goes into an affair of this kind. That it ran so smoothly is a credit to the Dinner Chairman, Bing, W2CMM, and his industrious committee: Mort,W2KR, who arranged for the wide variety of prizes; Mike, WA2BLH, who did the lion's share of the work in handling the ticket distribution; Irv, W2IVW, who was in charge of hotel arrangements; Mike again, Art,W2CYK Ron, W2SUC, Bing, and Gus, K9EBA,all of whom fretted and fussed over where to sit whom; Harry, W2JXH, who delighted the XYLs with the beautiful corsages each wore as mementos of the occasion; Mike, Art, Ron, and Irv,K2HEA, who bore the brunt of the attack at the door trying to satisfy all late-comers with last minute tickets; and Dorothy, K2MGE, who bought each of the ladies' prizes as though it was just what she had always wanted.

Our profound thanks also go to Butch, W9EatWisconsinCheese, whose generosity in supplying each of our dinners with his superlative Wispride cheese, deserves an especially loud hurrah. We also applaud the many manufacturers without whose cooperation these annual Dinners would never have been the successes they have been.

All in all, March 22 proved to be just as big a day in the life of the Sidebanders as advance reports indicated and reservations for next year's Dinner are already being accepted. We hope you'll be there!

****

1960 DAYTON HAMVENTION

The Dayton Hamvention, May 7th, will feature a Sideband Dinner on the evening of May 6th and a Sideband Forum from 0900 to 1200 on May 7th, among many other ham activities and forums. A Collins KWM-2 will be the main prize with a load of other prizes to be awarded the lucky winners. Reservations and information may be had by writing to the Hamvention, P.O. Box 426, Dayton 1, Ohio.

One of the speakers at the Sideband Forum will be K2HEA, "Sideband-er" Editor. A special "Dunking Session for SSBARA members and friends is planned during the festivities.

Your Editors will be in attendance and look forward to meeting our Midwest SSBARA members.

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CALL LETTERS FRV NL FD CHARGE TO JENNINGS RADIO MFG. CORP.

JUNE 30, 1961

Mr. Harold S. Geneen, President
Internatio al Telephone & Telegraph Corporation
New York, New York

All negotiations completed. We are taking the rice out of our hair at this moment. Look forward to a long and effective association.

Gal Townsend
Jo Jennings
& All the Rest
JENNINGS RADIO MANUFACTURING CORP. of DEL.

Send the above message, subject to the terms on back hereof, which are hereby agreed to

PLEASE TYPE OR WRITE PLAINLY WITHIN BORDER—DO NOT FOLD

1269—(R 4-55)

Arthur L. Greenberg

211 Willis Avenue, New York 54, N. Y.

February 8, 1961

Dear Jo,

This evening, we had a very nice visit with our old friend Maj, W/OJI, who had come into town for a business meeting. On the way home, we bought the NY Herald-Tribune and were excited to read the enclosed clipping. You had expressed in the past, your idea of joining forces with a major company, so that you could better expand and distribute the products which you have developed and manufacture. The selection of ITT looks excellent indeed. Congratulations on reaching this goal.

You will also be very much interested in the second clipping which we cut out of the NY World-Telegram & Sun.

I had hoped to discuss with you, when you would have come to NY, the possibility of investing money in the Jennings Co. because of our great faith in its future. Since you had changed your plans, I was going to write you about such an investment.

No , with the change taking place, I would appreciate it if you would look into the possibility of our investing some money (say $5,000.) in Jennings Radio Mfg. Corp. or ITT in a more desirable manner than through the regular channels of the stock market.

Needless to say, as Madeline had expressed in her letter to Ila, we are deeply disappointed that you will not be able to join us in March. We do hope that you will be able to make it some time later this year. We have no future plans at this time - the uncertainty

With sincere congratulations
And the best of wishes, too
For a future that
is very rich
In happiness for you

Dear Jo & Ila —
When I read about you
folks in the tabloid, I
immediately knew I'd have to
send you a card.
When I went to the
drawer to get this card I had
(inside)

3

focuses Loves directions, there will be no voids, but our lives will be filled with opportunities for loving service to others instead of with the longing for someone to love or to serve us." "There are no vacuums to be filled for infinity is permeated with Divine Love. Christian Science gives us the answer to fear of vacuums".

Through your "loving service" you have given much to Humanity, by understanding and utilizing Mathematical laws & truths.

"Love's divine adventure" is a reality to you - you and She will always travel its glorious pathway!

Lovingly, Liz Elliott

3

Our band, right beside it was an old Sentinel opened to an article by John J. Pelandes entitled, "No Vacuums in Divine Love"! This to me was rich sterling - just another proof of the "divine Coincidence" and a very positive one at that!

Your phenominal success Jo, is a wonderful example of "Science in Action" and I know you and She have publicly acknowledged this. I remember in class, Mr. Davis admonished us that we are all genius' and that we should work constantly with Christ, Truth that this Divine Love might be unfolded in our lives to bring out our God-given abilities and capabilities.

Quoting from the article, "If we

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1269—(R 4-55)

of our business situation has us a bit upset although we feel sure that any move that we make will be for the better.

Again, lots of luck from us both!

73 to you
88 to Ila

Arthur







BUSINESS *As Usual*

By NORMAN H. BOWMAN
Staff Business Writer

Well Deserved Honor

Good work by industrial firms may seem by some to go unnoticed occasionally, but the reverse is often true. Doing a good job all the time may not be glamorous, but it does breed respect.

Noteworthy in this regard is a new State award given Jennings Radio Manufacturing Co. here by the State Veterans Employment Committee. The award is presented annually to the firm that has contributed most to interest and activities in hiring and training veterans, disabled veterans and disabled non-veterans. Only previous winners in this county have been Westinghouse Electric in Sunnyvale and Be-Ge Manufacturing Co. in Gilroy.

Jennings, with about 70 employes 10 years ago, had 444 as of last Dec. 1. On that day, 203 of its 318 male employes were veterans, and nine of these were physically handicapped, including blind, amputees, heart cases and several with discharges from mental institutions. Jennings has built special benches for two blind persons, and another for an individual dwarfed by a bone disease.

On top of this, Jennings has a firm policy of nondiscrimination regarding race, creed, color, or national origin.

★ ★ ★

San Jose Mercury Herald
April 20, 1961

New In Business

Graham Judge, president of **Judge Steel Supply Co.**, 930 N. Ninth St., reports the closely-held corporation has upped its capitalization from $25,000 to $220,000. Inventory of hot rolled, bar and cold finished steel products will be upped sharply to keep pace with local demand. . . . ● Frank Bongiorno, of 1517 Crestview Dr., who formerly had Eastern Appliance Co. in Winchester Shopping Center, has an Italian name that means "good morning." So he's opened his new **Good Morning Mattress Co.** 3288 Stevens Creek Blvd.

When **International Telephone & Telegraph Co.** holds its first annual meeting ever held west of the Mississippi in S.F. on May 10, the event will have more than passing interest here. IT&T has a Palo Alto lab, is parent concern of Lenkurt Electric Co. in San Carlos, and only last February acquired the pioneer **Jennings Radio Manufacturing Co.** here.

Sunday Mercury-News
May 7, 1961

Company News

S.J. Mercury Sunday AM

april 2, 1961

International Paper Co., with a large container and corrugated board plant here, will start up a similar plant in Northlake, Ill., in October, and a new container plant in Larimore, Mo., in July. . . . ● **International Telephone & Telegraph Corp.**, parent concern of Jennings Radio Mfg. Co. here and developer of major laboratories in Palo Alto, will hold its annual meeting May 10 in Hotel St. Francis, S.F. The last two were held in N.Y. and Baltimore. . . . ● On Monday, **Standard Oil of Calif.** introduces its new RPM Special motor oil, containing ashless detergent that keeps combustion chambers clean and moving parts free of sludge for longer trouble-free engine life.

New Plant Site, Prunedale.
1961 and 1962

















In Prunedale plant,
1962

